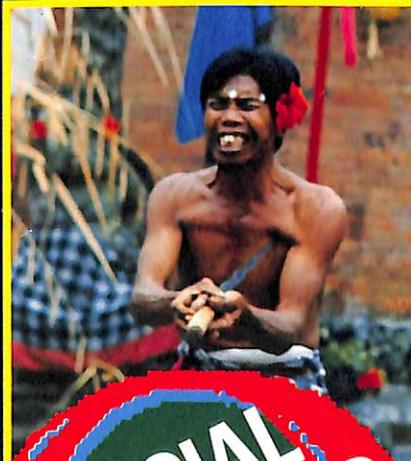
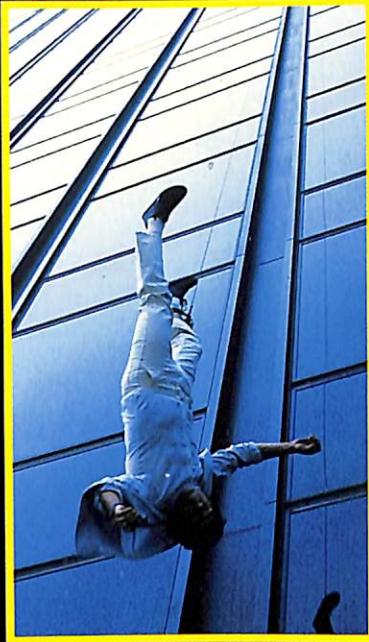


QUEST

THE SCIENCE OF MAGIC

EXTRA! **TRICKS**
PROJECTS
BRAINTEASERS
GIANT POSTER
MAKE A MAGIC BOX



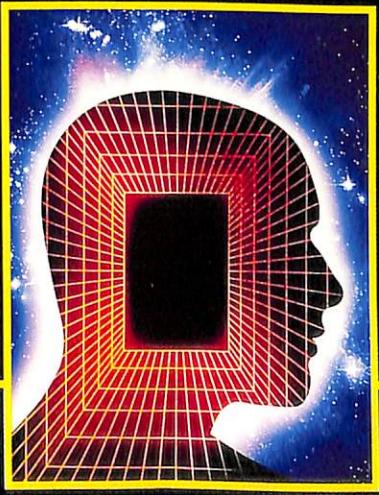
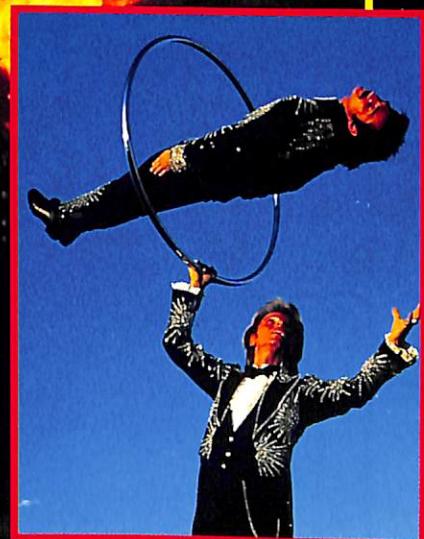
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- *The power of the mind*
- *Great illusions*
- *Fake – or real?*
- *Movie special effects*

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FACT FILES

- Secret forces
- Great illusions
- Beyond belief
- Mindbending
- Movie magic

GIANT POSTER

Behind the silver screen



MODEL The magic box



PROJECTS/TRICKS BRAINTEASERS

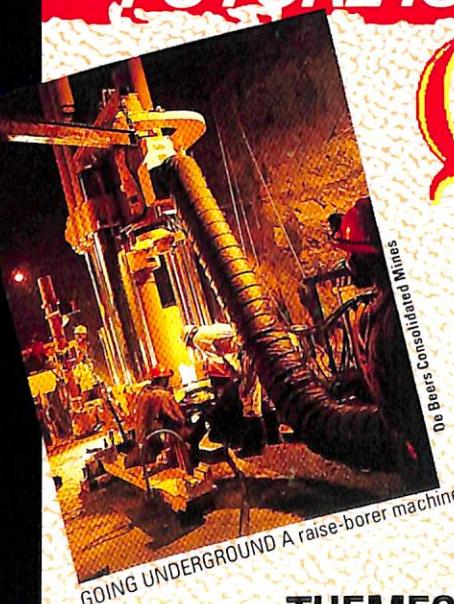
- The magic rings
- Test the pyramid's power
- The flipping matchbox
- Threading the needle
- Find the odd man out
- Complete the sequence

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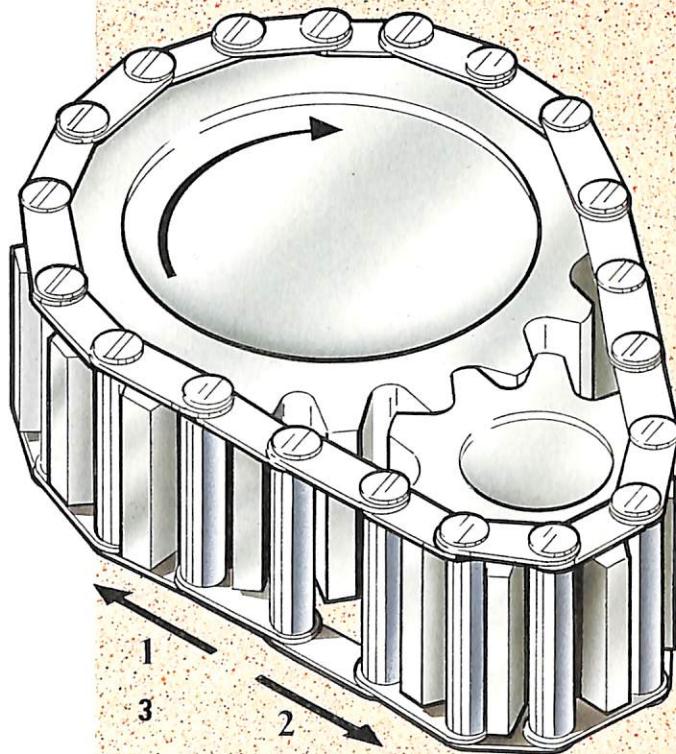
BRAINTEASERS

These six puzzles have been designed to test creativity, intellectual ability, aptitude and interest. The quicker you can solve them, the greater the level of your abilities. (Answers overleaf)

1

NEMTOR
UOBRDREA
QUIRAFE
UPPLRE
EPORRNO

One line contains the scrambled letters of a colour. Which?



The gears are enclosed in a drive chain. When the big wheel turns in the direction shown, which way will the chain move? (a) 1 (b) 2 (c) it cannot move

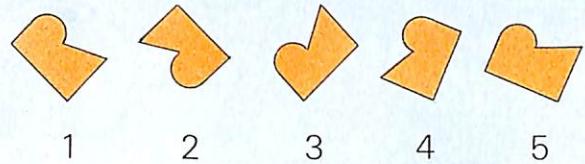
5

CO(...)AL

What is the missing word that will complete the first word and begin the second word?

2

Which of the shapes does not belong?



1 2 3 4 5

4



A lion, a leopard and a jackal together eat a zebra. The lion could, on its own, consume the zebra in 1 hour. Alone, the leopard would take 3 hours and the jackal would take 6 hours. How long does it take for them to eat the zebra together?

6

28				
30				
20				
16				
	?	19	20	30

What is the missing number?



MODEL MAGIC BOX

ASSEMBLY INSTRUCTIONS

You will need

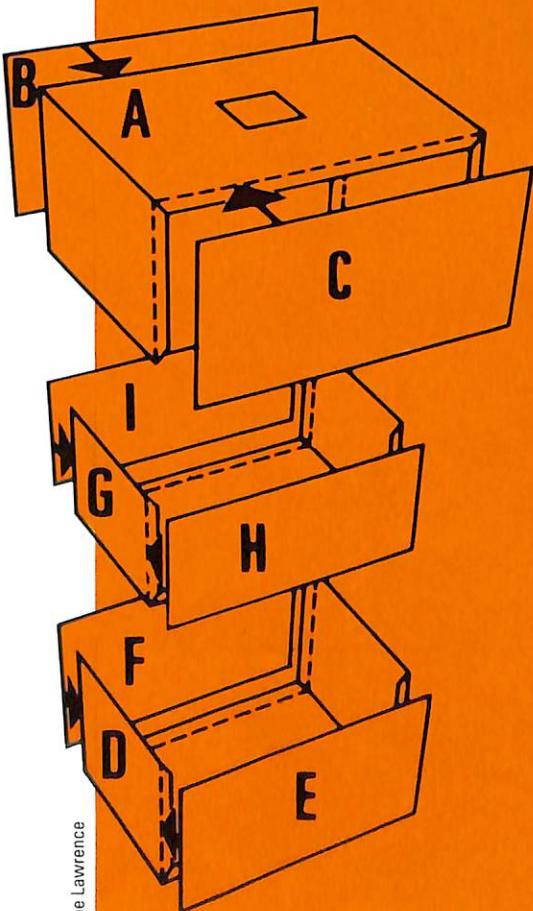
Scissors • Ruler • Craft knife • Glue
Short length of 15 amp fuse wire.

Before cutting out the pieces, score along all broken lines with a blunt edge and ruler to make folding and gluing easier. Study the ASSEMBLY DIAGRAM to see how the pieces fit together.

NB Younger children will need supervision when using a craft knife.

To make up Box

- 1 Cut out lid **A**. Use craft knife to cut out square hole. Fold to make three sides and fold tabs down.
- 2 Cut out lid side **B** and glue to tabs of **A**.
- 3 Cut out lid side **C** and glue to tabs on **A**.
- 4 Cut out **D**. Fold to make three sides and fold tabs down.
- 5 Glue **E** to tabs on **D**.
- 6 Glue **F** to tabs on **D**.



Joe Lawrence



Secret compartment

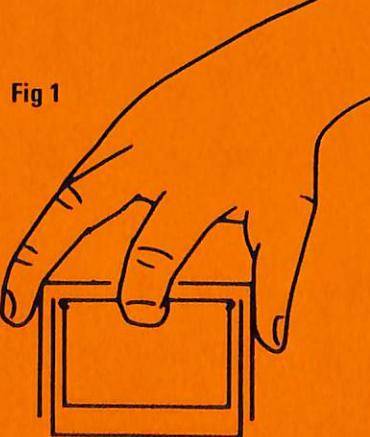
- 1 Cut out compartment **G**. Fold to make three sides. Fold tabs.
- 2 Cut out side **H** and glue to tabs of **G**.
- 3 Cut out side **I** and glue to tabs of **G**.
- 4 Take short length of 15 amp fuse wire and push ends through sides **H** and **I** at positions marked, to make secret lifter. Bend ends of wire to keep it in place.

How to use

Carefully pack the secret compartment

with silk handkerchiefs and trinkets and cover it with the lid.

Display the lid (plus the secret compartment) and the empty box to your audience. Next, pick up the lid with your thumb and little finger, poking your middle finger through the hole in the lid and hooking it under the wire lifter (see Fig 1). Tilt the lid slightly towards the audience so that the secret compartment will not be spotted. Put the lid on the box, say the magic words and hey presto, you can remove the lid and pull out the items inside – to the amazement of all!



Brainteaser solutions

1. Line 4 2. 4 (All the others can be rotated so that they coincide) 3. c 4. 40 minutes 5. MET 6. 25 (orange = 7, pear = 8, grapes = 2, banana = 3) Complete all in 5 mins – excellent, 10 mins – average, 20 mins plus – poor.

THE MOVIE

BEHIND THE SILVER SCREEN



CREATING THE UNIVERSE

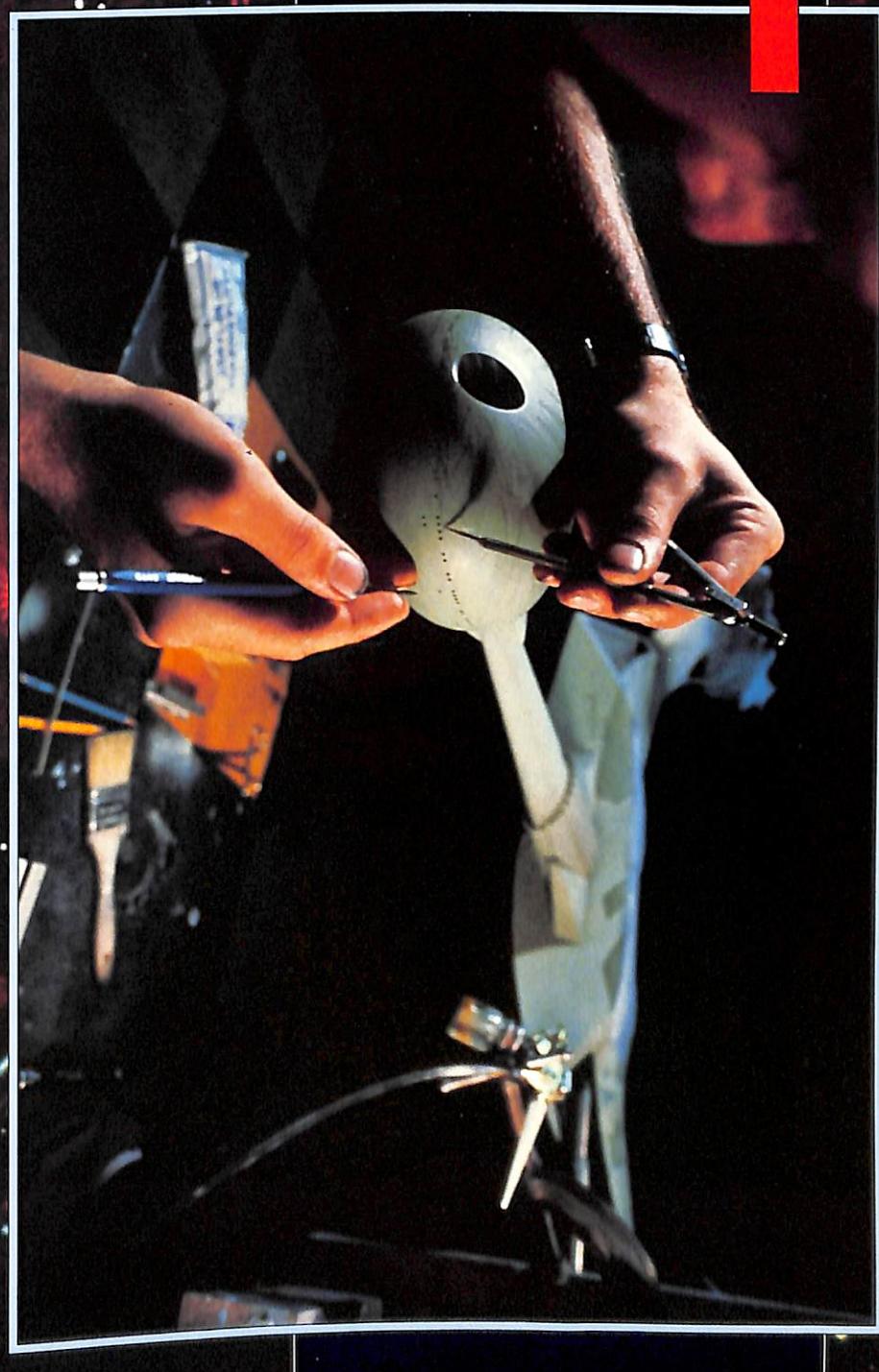
Great efforts were made with special effects for all the *Star Trek* movies. It was essential for their success that the films gave as realistic an illusion of space flight as possible.

The three-minute opening sequence of *Star Trek II - The Wrath of Khan* shows a computer-animated star field created from a data-base of over 6,000 stars. Unlike the random pin-pricks through a backdrop used in most earlier movies, the computer graphics star fields are 'real' with all the stars represented in their correct colours, magnitude and relationship.

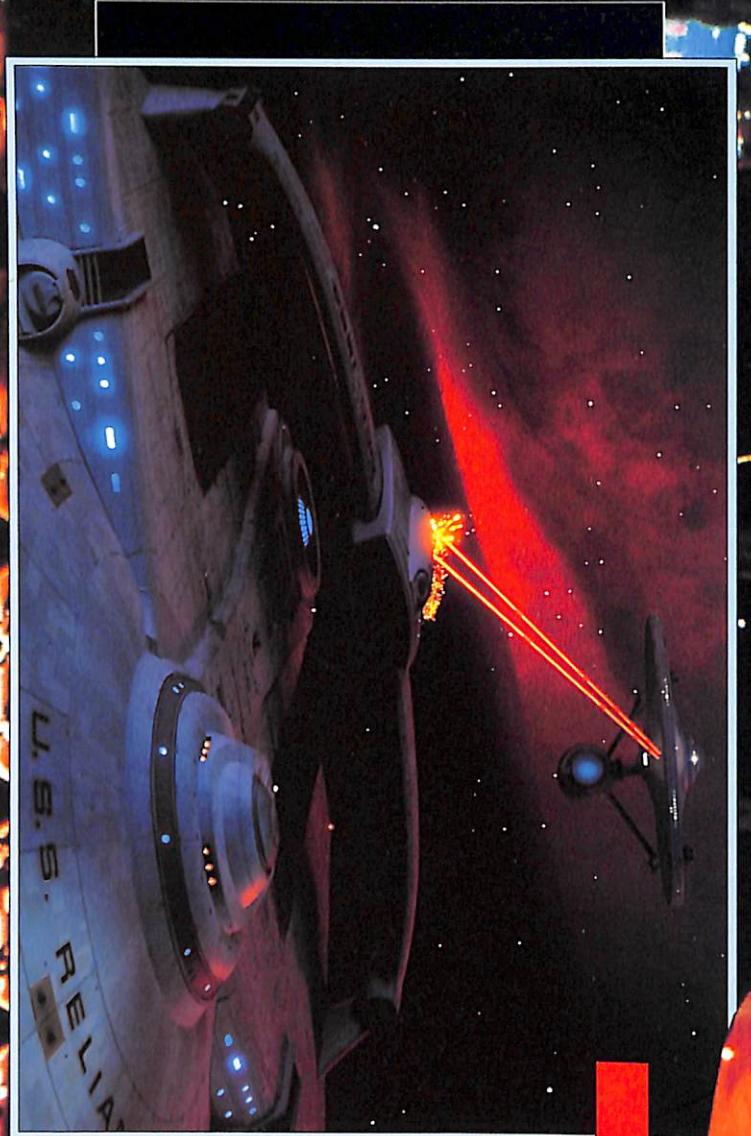
Special effects in this movie were created at George Lucas's Industrial Light and Magic studio on VistaVision. This uses a technique which runs 35mm film through the camera horizontally at double speed as a cheaper alternative to 70mm film. The only snag is that the camera is exceptionally large, weighing over 180kg, and needs four men to move it, even for the smallest change in position.

MODELLING THE SHIPS

Ships for all the *Star Trek* movies were made in painstaking detail. The main model of the *Enterprise*, first used for *Star Trek - The Motion Picture*, was over 2 metres long, machined from metal and packed with wiring for the internal lights. It cost over \$1 million to build. Other vessels, such as the Klingon cruiser shown here, were made of lightweight vacu-formed plastic. Often two models were made, one for close-ups and the other for distance shots. A third might be used for explosive destruction.

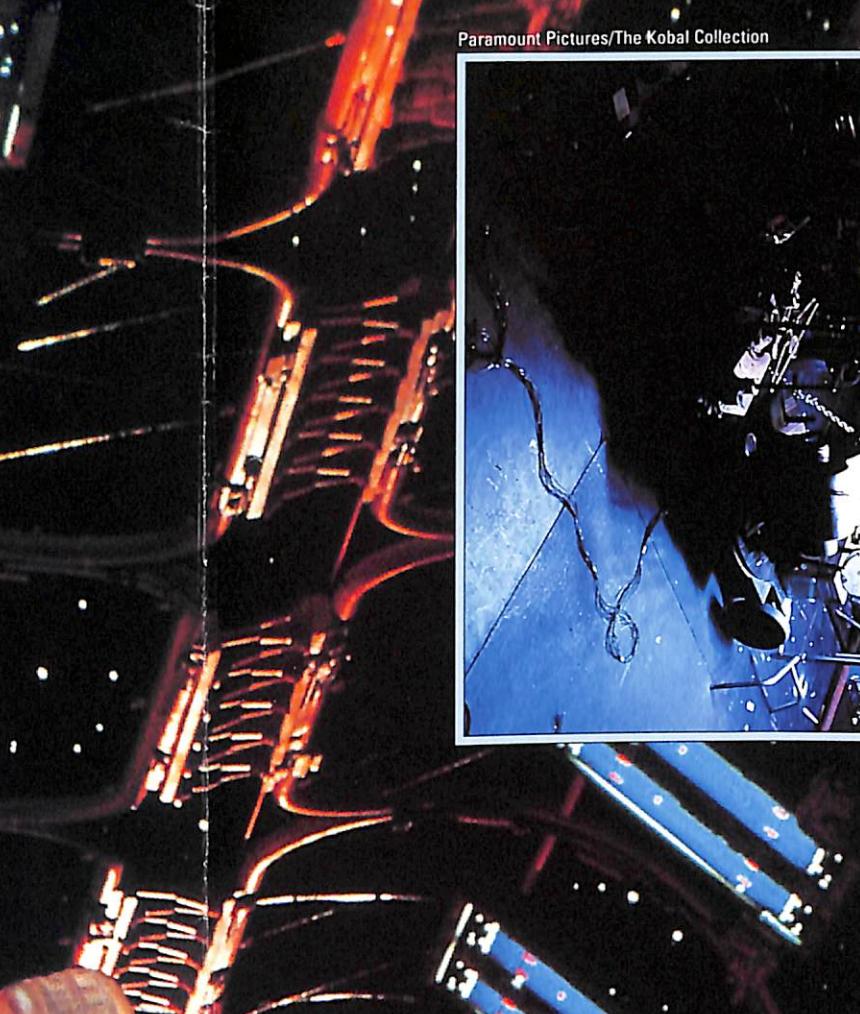


STAR TREK

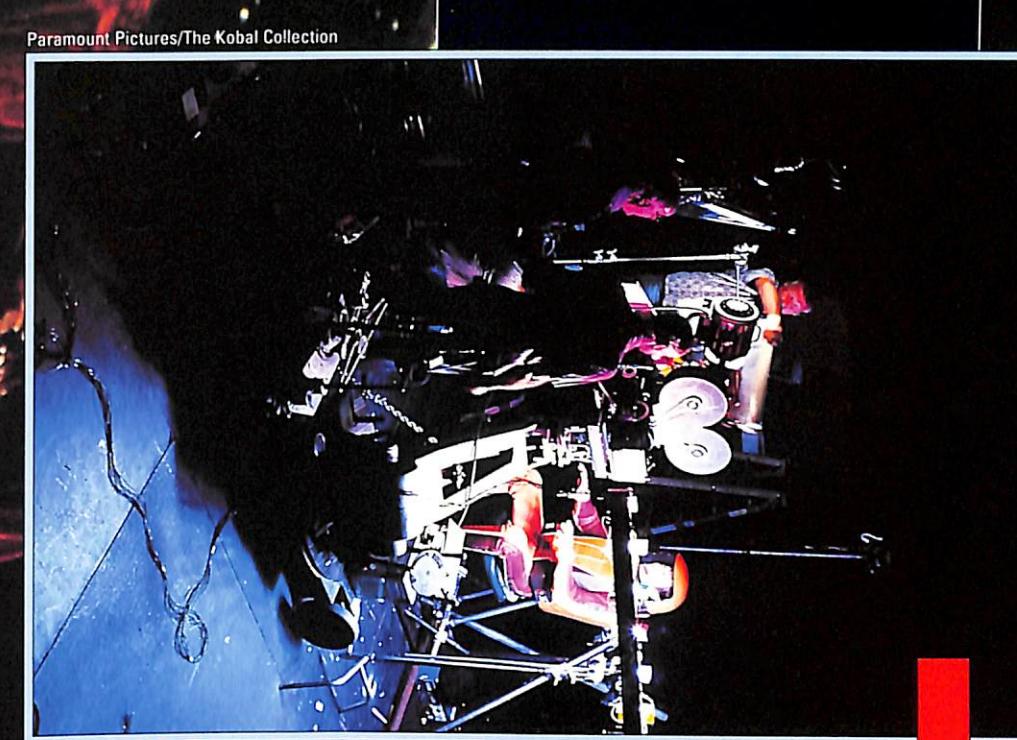


THE FINAL BATTLE SCENE

The climax of *Star Trek II - the Wrath of Khan* is a battle scene in which the *Enterprise* fights the hijacked *Reliant*. Badly damaged, the *Enterprise* ambushes the *Reliant* by hiding in a nebula. The nebula was created in a 1.2x2.4 metre cloud tank, in which white latex was injected between layers of fresh and salt water. Colours were achieved with lights and a little pump moved the water, creating the storm-cloud shapes. In all, 18 separate images - such as the ships, nebula, stars, phasers and flying debris - were combined for the two-second shot.



Paramount Pictures/The Kobal Collection



MAKE-UP - THE GRISLY FACTS

Close-ups of Mr Spock (actor Leonard Nimoy) being made. Spock's make-up required about 2.5 hours each day. The famous ear-tips were moulded from latex rubber. Because they were destroyed every time they were taken off, a new set had to be remoulded and baked in an oven, a process taking 3 to 4 hours - every day for the 18 days of shooting.

For effects of grisly burns, make-up artists Werner Keppler used food-processing gelatin, applied to the actors with a spatula, sculpted as necessary then coloured as required.

QUEST



PROJECTS

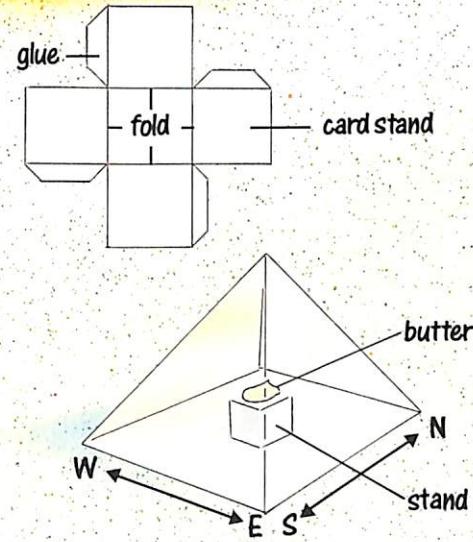
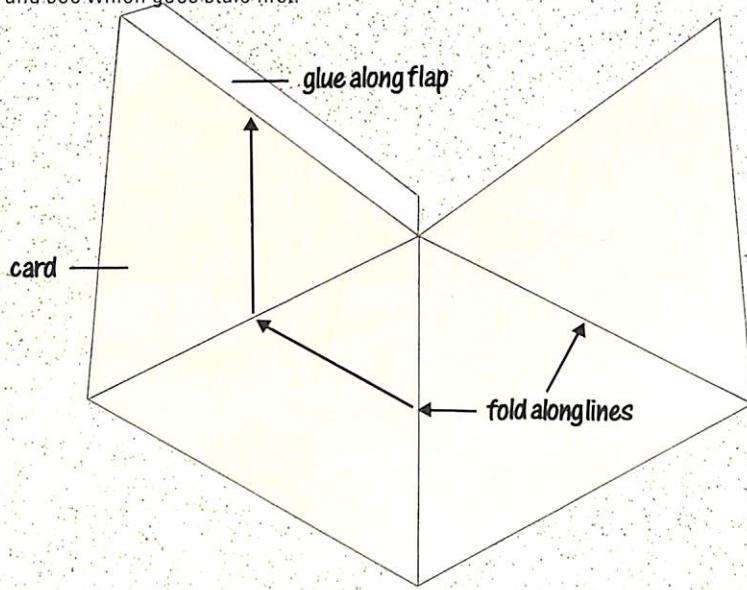
- How can you preserve a piece of butter outside the fridge?
- How can you find hidden objects with your mind?

TEST THE PYRAMID'S POWER

1 2 4 5

The Great Pyramid of Cheops in Egypt is said to possess special powers – based, reputedly, on its shape.

To make a model of the pyramid and the stand trace the patterns below onto card or stiff paper and cut them out. If you want a larger model, double or treble the lengths of the lines. Fold along the dotted lines to form the pyramid shape, then tape or glue the flap in place to secure the model. Fold and glue the stand. Place a piece of butter on the stand and cover with the pyramid. Use a compass to align the sides as shown. Put another piece of butter outside the model and see which goes stale first.

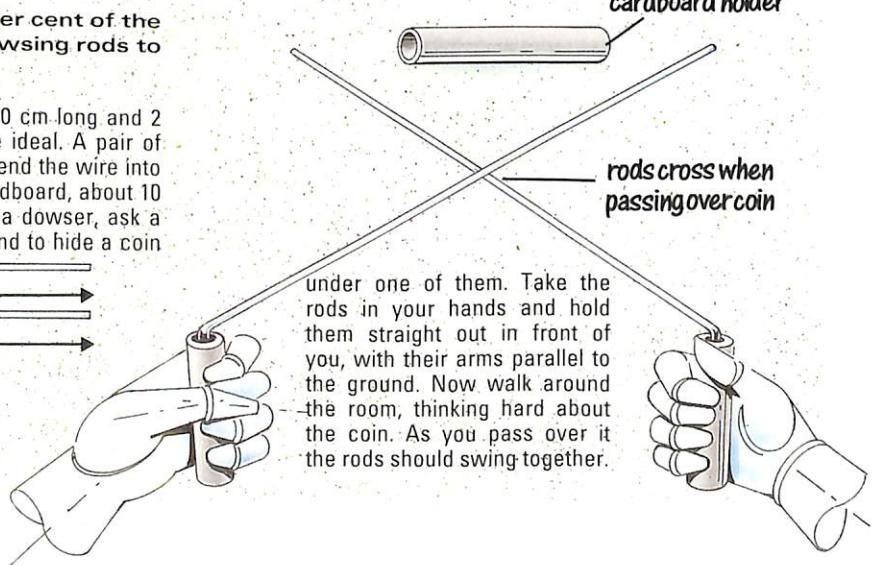
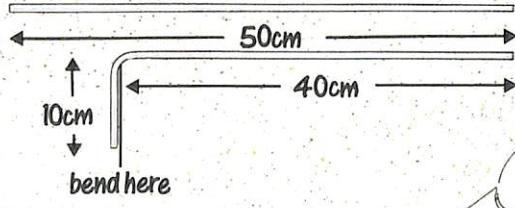


DOWSE FOR HIDDEN OBJECTS

1 2 3 4 5

American research has shown that 99 per cent of the people tested could successfully use dowsing rods to find water or hidden objects.

You need two lengths of stiff wire, each about 50 cm long and 2 mm thick – straightened metal coat hangers are ideal. A pair of side-cutting pliers will be necessary to cut and bend the wire into the 'L' shapes as shown. Use two rolls of stiff cardboard, about 10 cm long, for the handles. To test your ability as a dowser, ask a friend to place ten sheets of paper on the floor and to hide a coin





PROJECTS

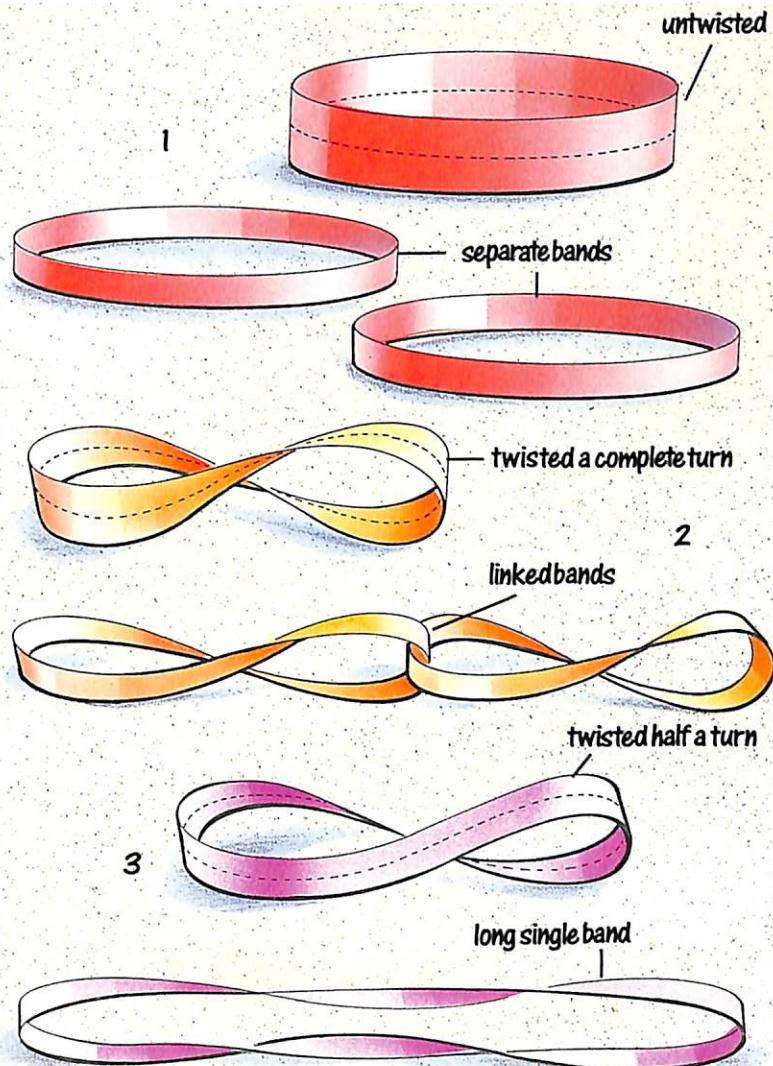
MAGIC

- Make magic rings from paper strips.
- See ordinary matches mysteriously form a star.
- How can you make a piece of steel float on water?

THE MAGIC RINGS

The special properties of the Möbius (pronounced mürbius) strip produces a surprising effect.

Take a large sheet of paper – a sheet of wrapping paper is ideal – and cut it into three, equal strips about 50 mm wide. Glue the ends of the first strip together to form a band. Repeat for the second strip but, before gluing the first end to the second, twist it a complete turn. Repeat for the third but, before you glue the first end to the second, this time twist it half a turn. Now cut along the centre of each of the bands and see what happens. You may be surprised. The first band will produce two, separate bands, the second will produce two, linked bands and the third, a long, single band. Although the first and second strips have, as is normal with a sheet of paper, two surfaces, the third actually has only one.



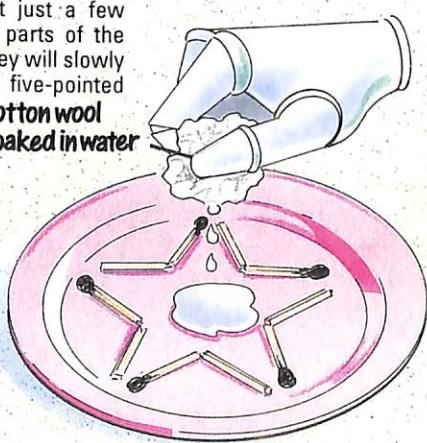
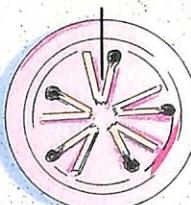
MYSTERIOUS STARS

When wood is wet it swells. Use this property to perform a simple trick.

Take five matchsticks and bend them in half, without breaking them, to form a 'V'. Arrange them on a plate as a ten-pointed star with the bends at the centre as shown. Screw a piece of cotton wool into a ball, wet it in a glass of water, then squeeze it gently over the centre of the star. Let just a few drops fall on the bent parts of the matches and watch. They will slowly straighten and form a five-pointed star as the wood expands.

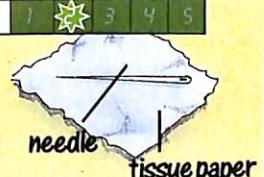
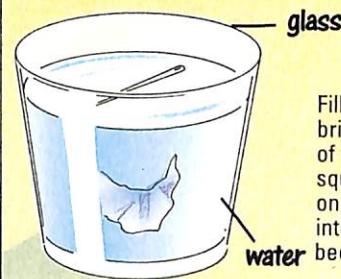
cotton wool
soaked in water

bent matchsticks



FLOATING STEEL

A needle can float on water because of surface tension – the 'skin' on the top.



Fill a glass to just below the brim with water. Take a piece of tissue paper and tear a small square. Now place the needle on the paper and gently lower it into the glass. The paper will become saturated and sink.

PROJECT INFORMATION

Each QUEST project has its own difficulty rating: 1 very simple, 2 simple, 3 intermediate, 4 advanced, 5 complicated.

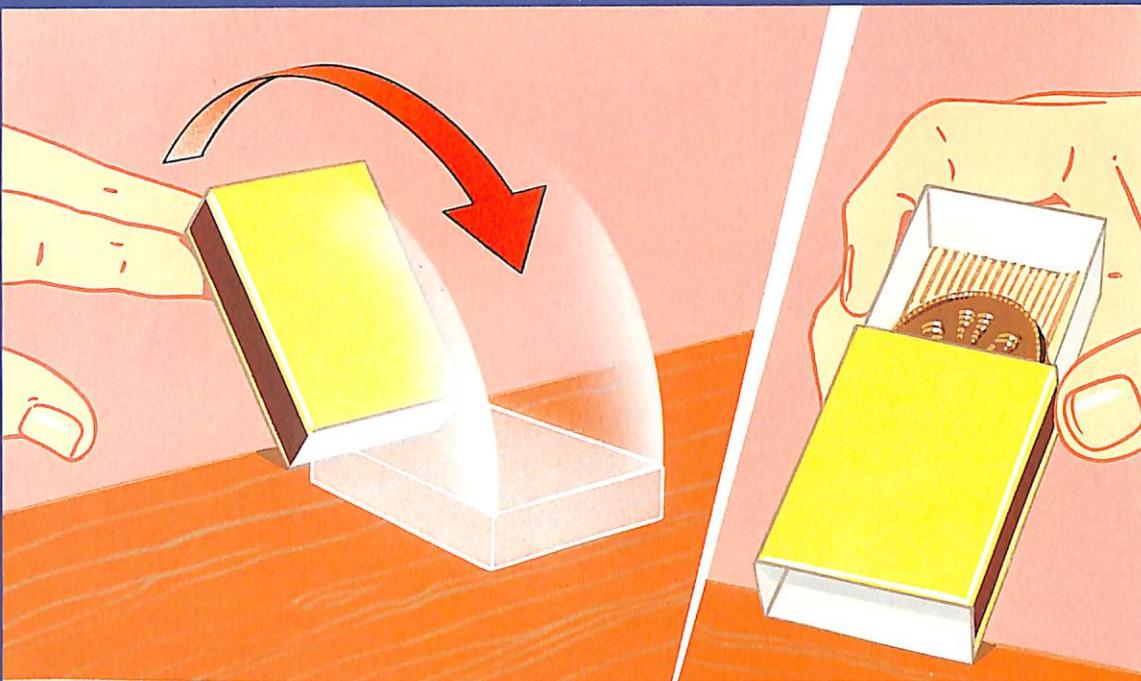
Every care has been taken to ensure projects are as safe as possible. However, parents should supervise all projects. The publisher can accept no liability for any injury.



WARNING!



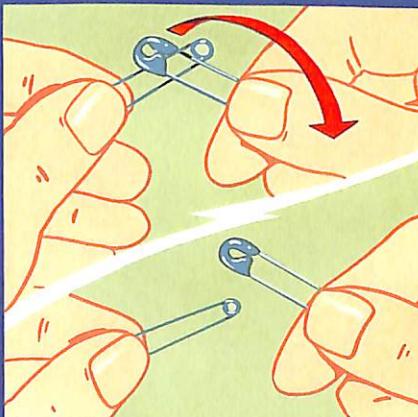
MAGIC TRICKS



THE FLIPPING MATCHBOX

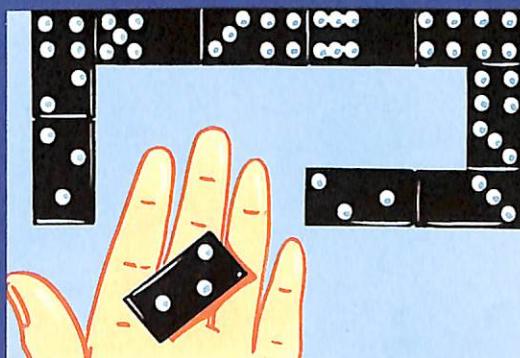
How is it only you can make a small matchbox stand on its end? Use a matchbox with identical labels on both sides or soak the label off one box and put it on another. Then take the matches out,

put a ten pence coin in the bottom and cover with the matches. Always start with the coin at the bottom. As you pass the box across to a challenger, deftly turn the box over so that the coin lies on top. Now it will always fall over on to its long side.



PIN THROUGH PIN

How can an ordinary household safety pin, linked to another, be pulled through it without opening either? Challenge a friend to try. He or she will find it's impossible. Holding each between your thumb and first finger, pull and, as the two ends meet, twist the right-hand safety pin anticlockwise while continuing to pull. Although it will work if you do this slowly it is far more effective and puzzling if it is performed sharply.



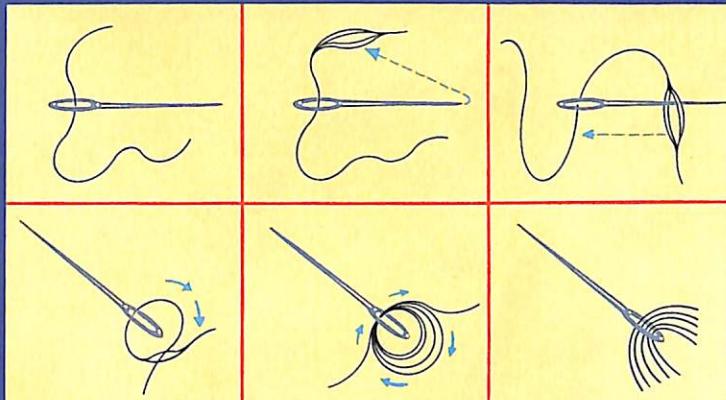
PREDICTABLE DOMINOES

How can you predict which two numbers a challenger will end with when laying out a set of dominoes? A complete set of dominoes can be linked in an endless ring. So, to create a 'break' all you have to do is secretly remove any domino. The two unmatched numbers in this now 'broken ring' will always correspond to that domino. You can then secretly substitute the hidden domino for another and 'predict' the two end numbers once more.



MAGIC TRICKS

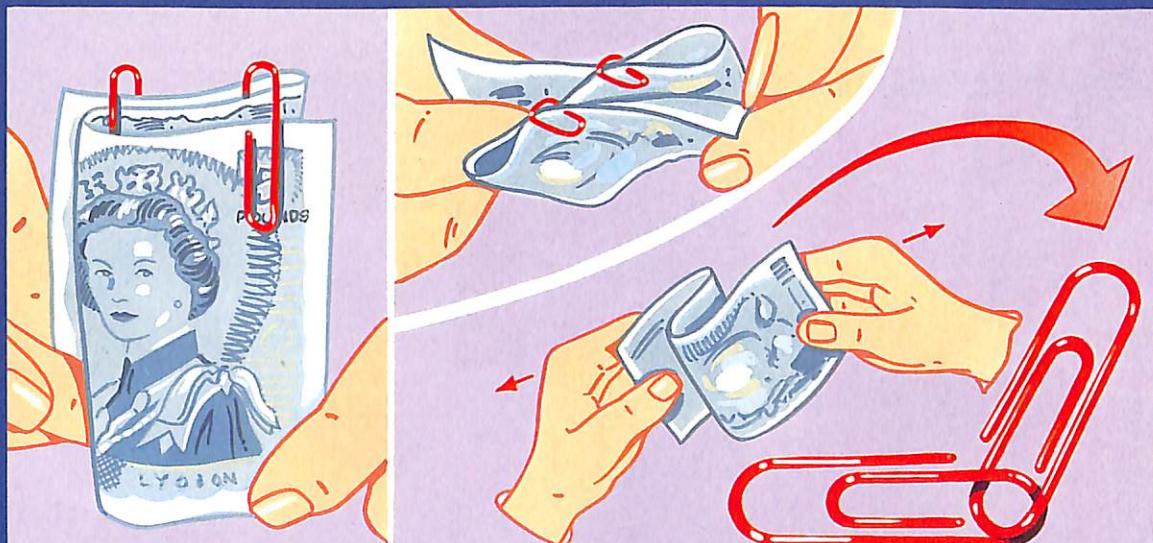
One of the most impressive types of magic is that which can be performed right under people's noses - magician's call it 'close-up magic'. These five tricks, however, are special variations known as 'Betchas' - short for 'bet you can't do it'. In each case you can challenge a friend or group of friends to pull one safety pin through another or thread a needle at least twelve times. Then, when they fail, you can do the seemingly impossible.



THREADING THE NEEDLE

Challenge anyone to thread a needle at least twelve times. Take 150 cm length of cotton thread and a needle with a relatively large eye. Thread the needle, rub the cotton between your fingers until the strands separate then pass

the needle through the hole. As you draw the thread downwards more and more thicknesses of the thread will pass through the eye. Use a pair of scissors to snip off the lower parts of all the loops. The needle will be threaded at least twelve times.



LINKING PAPER-CLIPS

Why is it only you can make two paper-clips link magically? Hold each end of the banknote or a similar-sized piece of paper and fold it into an 'S' shape so that the ends extend a little past the folded curves. Now casually place the paper-clips over the middle and end section of the note as shown above left. Take both ends of the note in your hands and sharply pull it straight. The paper-clips will fly off the note. When you pick

them up they will be linked together. Reassemble the paper-clips onto the note and challenge a friend to make them link. Tell him or her to grasp the ends of the note and pull sharply. The paper-clips will fly off as before. But they will not be linked. The secret is in the assembly. The second time you put them on - as casually as you did the first time - slip the paper-clips over the folded ends of the note as shown above centre.

MAGIC BOX

F

E

C

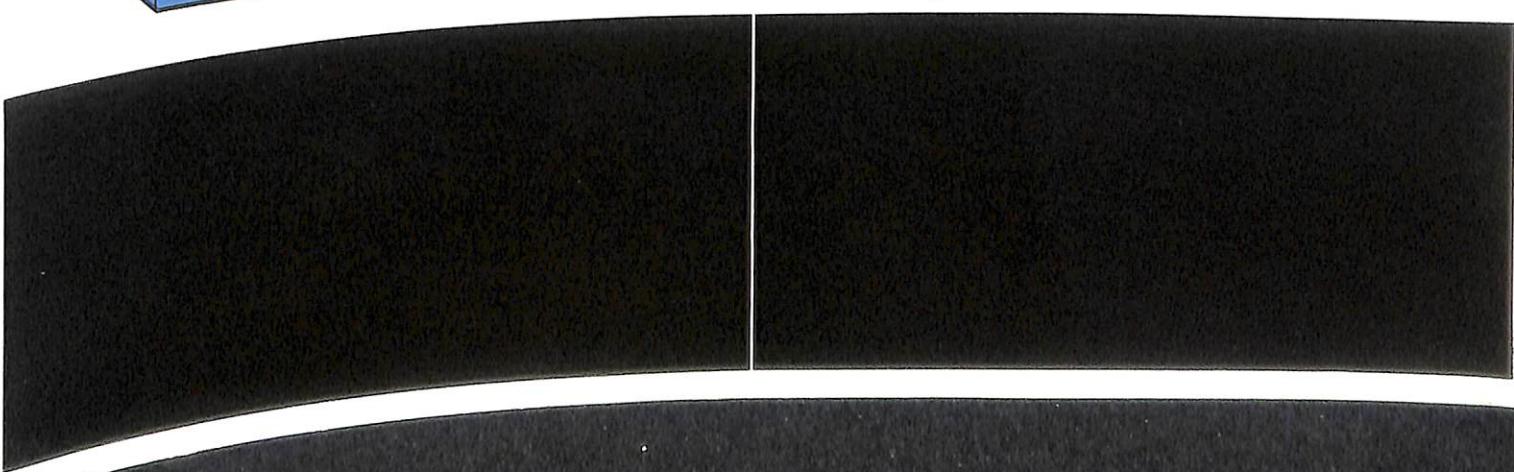
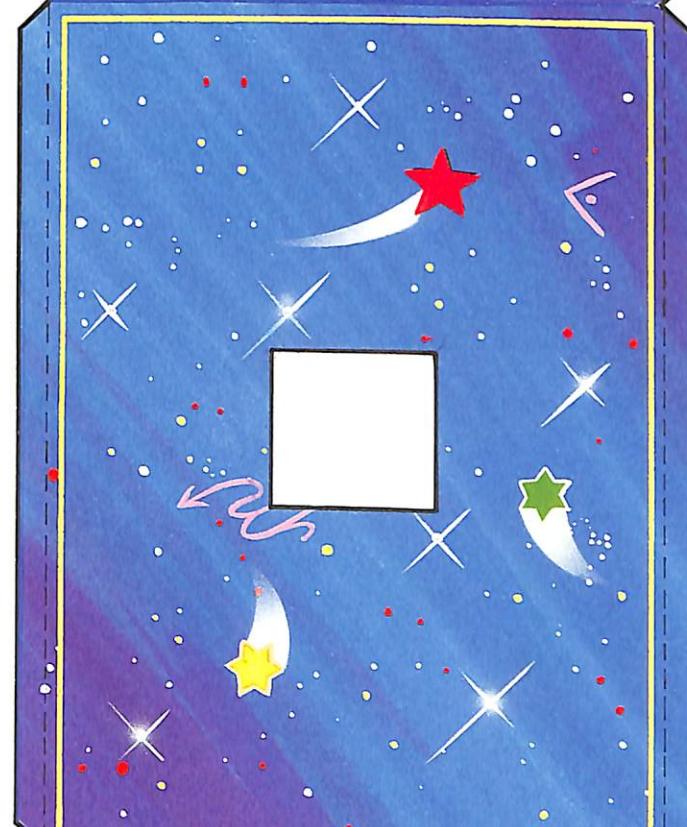
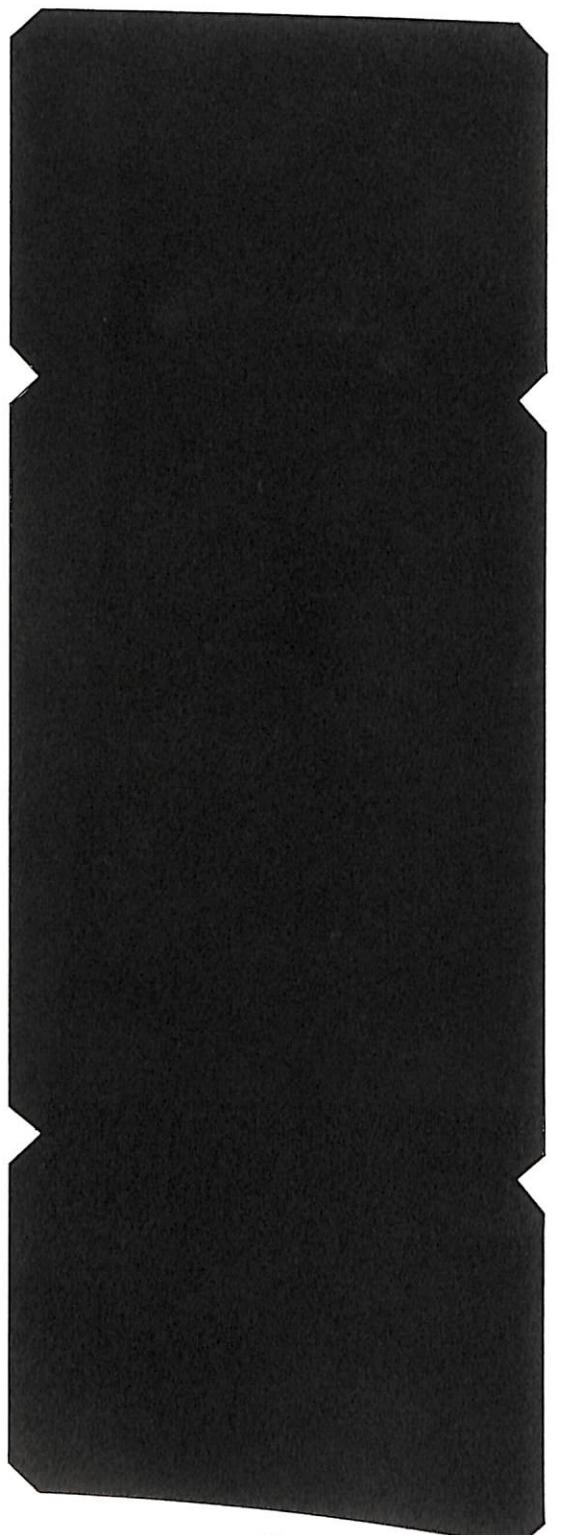
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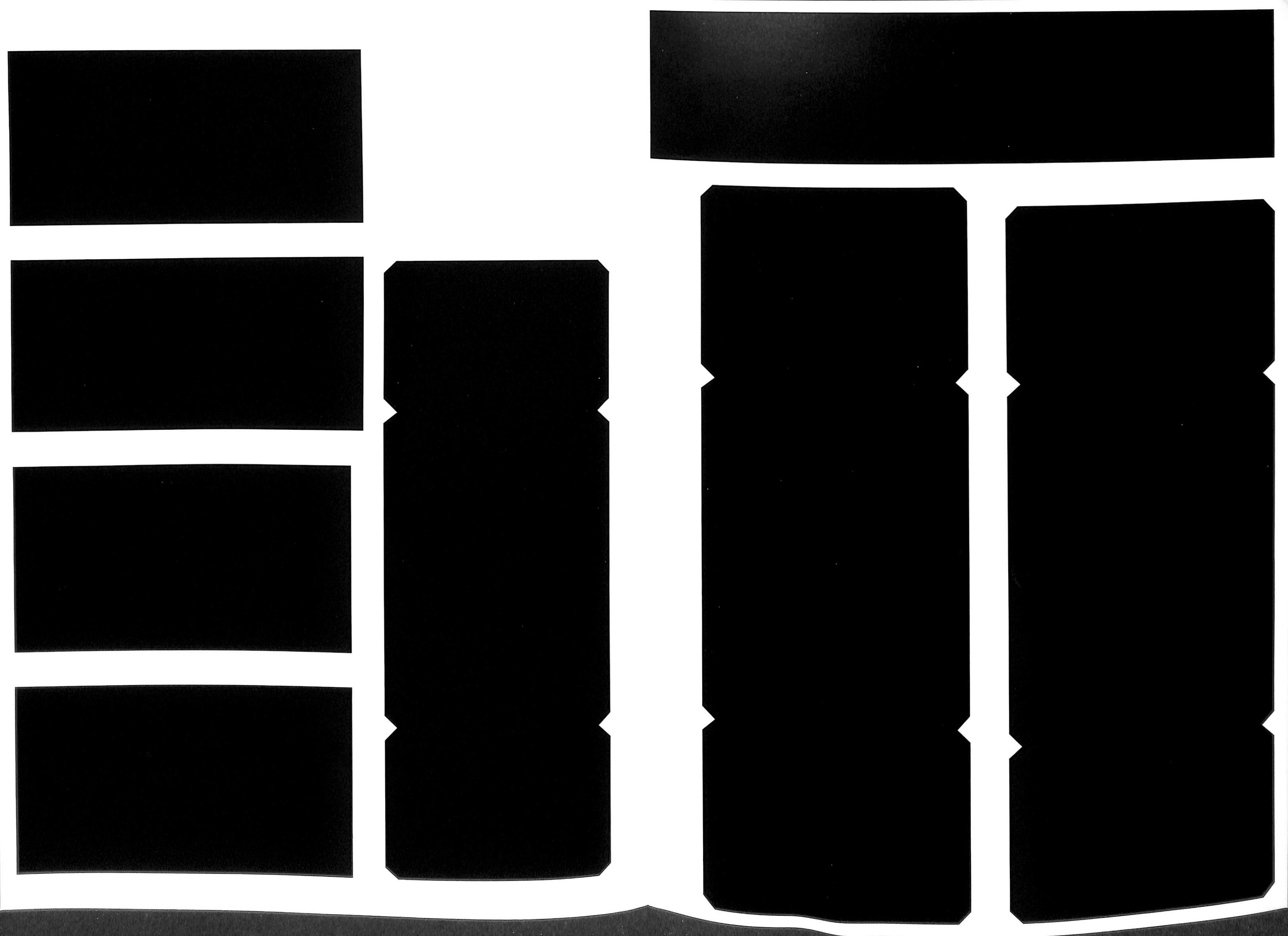
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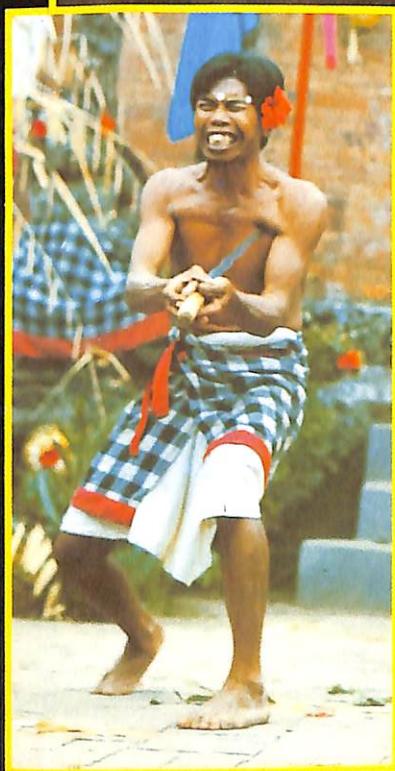
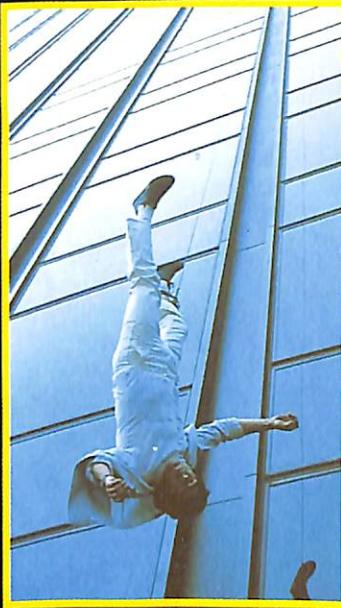




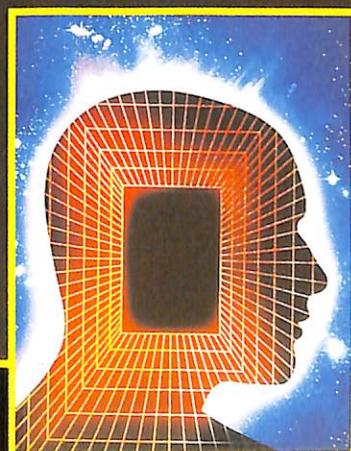
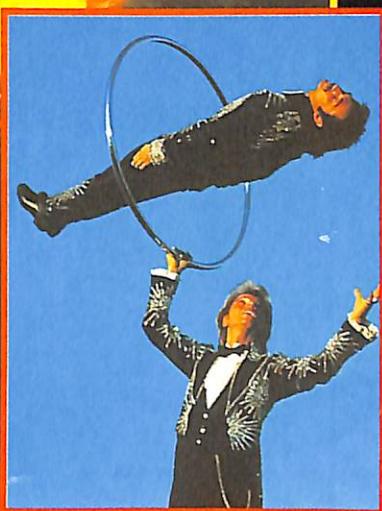
QUEST

THE SCIENCE OF MAGIC

MAGIC



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FACT FILES ON:

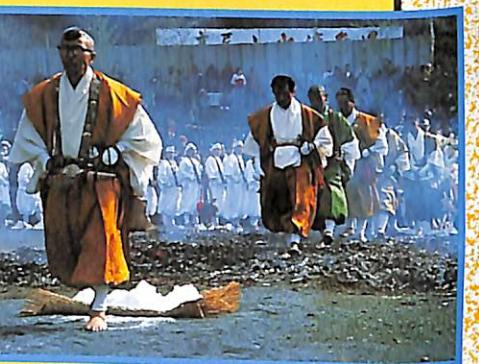
- *The art of the impossible*
- *The power of the mind*
- *Great illusions*
- *Fake – or real?*
- *Movie special effects*

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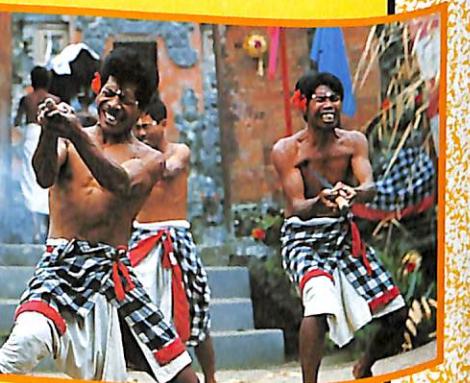
Sawing a lady in half – suspension and levitation – the Indian Rope Trick – the substitution trunk mystery – solid through solid – vanishing – escapology – Great Magicians: David Copperfield – ABRACADABRA: The magic rope – Q View: The Occult



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24-29

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WARNING
The feats, magic illusions and movie stunts described in this publication are performed by experienced professionals. Under no circumstances should you attempt to reproduce them.

FIRE FEATS

SWORD SWALLOWING

OPTICAL ILLUSIONS

SECRET FORCES

SOME PHENOMENA ARE SO amazing that the only explanation can be magic. But behind almost every supernatural feat, from the simple yet baffling to the powerful and awesome, there lies a scientific explanation.

The flames lick upwards from a pit of fire and sparks fly as attendants rake the coals. The heat is so intense that people watching have to keep their distance. The temperature may be high enough to melt steel.

Surely to walk through a fire like this is asking to be burnt alive? And yet people all over the world, from Greece and Africa to Japan and the Philippines, take part in fire walks. They make a special occasion of it – often a religious one.

Fiery secret

How is it done? Do you need to meditate first? Do you have to be able to control pain? Do you need years of special training? Does religion come into it? What is the secret?

A few years ago these same questions intrigued an American physicist, Dr Bernard Leikind, so he

Tony Stone Photo Library, London

Fire eating is one of the seemingly impossible feats that require great practice, but no special powers. The human flame thrower effect is achieved by blowing a spray of lighter fuel or petrol through the teeth – the fine spray being ignited by the already flaming torch.

SECRET FORCES

1

Pack and Fact file cover: Fire-eater blowing out flames; stuntman Andrus for his revolving illusion. To obtain the Space Warper Disc kit of optical illusions send \$6 to Jerry Andrus, 1638 East First Ave., Albany, USA.



Frank Spooner Pictures

A novel version of the 'bed of nails' feat involves riding a motorcycle over a modern-day 'fakir'. The large number of nails lets the weight be borne without pain or injury.

The Bed of Nails is not quite as uncomfortable as it seems. Averaging the performer's weight over every nail, you'll find that each nail bears less than 10 grams.

decided to investigate for himself. In Japan he had noticed that the fire was built with great care. It was constructed of a bed of straw, then a thin layer of wooden sticks. A knee-high pile of firewood along the sides of the bed gave out impressive flames, but the embers along the centre of the pit soon began to cool. The Japanese head priest briefed the fire-walkers very precisely. "Don't walk too slowly," he said, "and don't step where the flames are coming up." This turned out to be good advice.

On a Sunday afternoon at Caltech

sports field in California, USA, Dr Leikind had a fire-pit built of oak logs, and he measured the temperature electronically. It was 760°C. A thousand people turned up for the demonstration and 125 of them walked barefoot across the hot coals. There were no serious injuries, although a few people got some minor blisters.

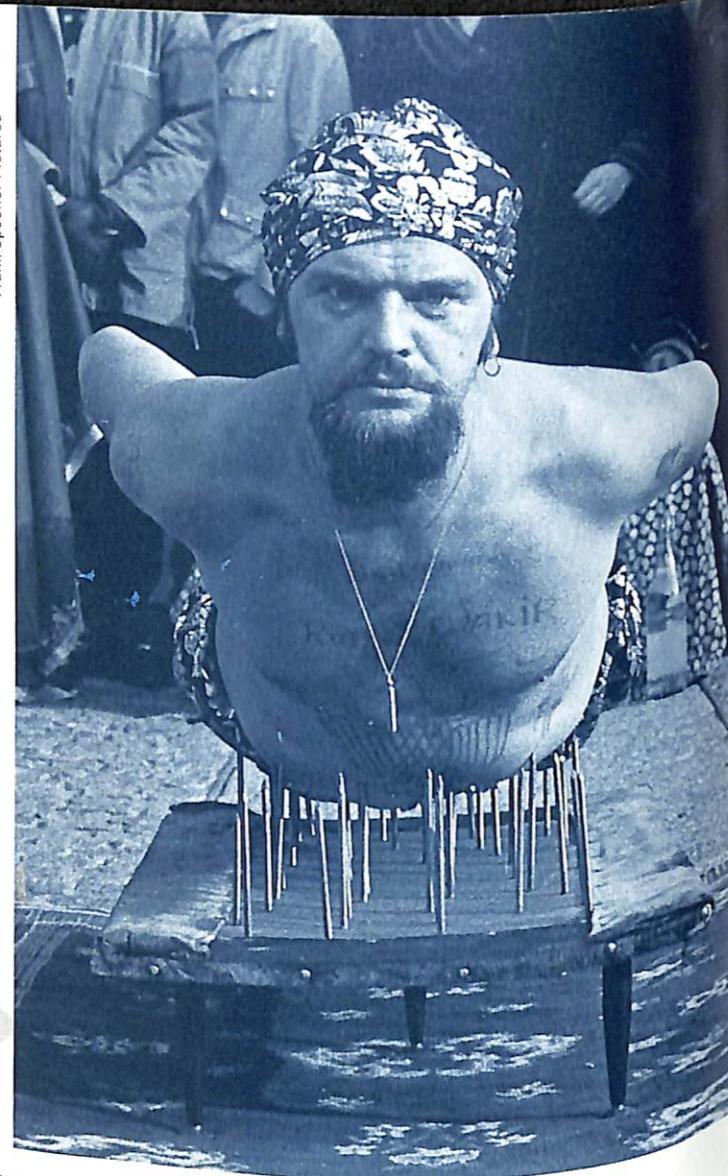
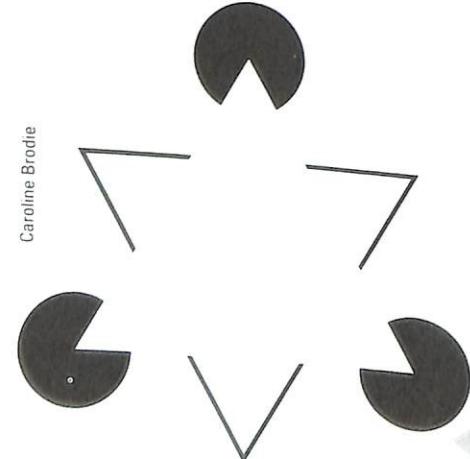
Conduction

Dr Leikind explained the mystery. It's not the temperature that's important — it's how well things pass on heat. The same effect happens with a cake in a hot oven. Everything inside the oven is at the same temperature, but the cake does not pass on the heat as the shelves and side of the oven would. Touching the cake briefly won't burn you. It's the same with the feet of the fire-walker.

The embers (like the cake) are poor at passing on heat and they won't have time to burn you if you walk across briskly, but a fire-walker who walked on metal would be severely burned. To complete the fire-walk, you do indeed need to

Kanizsa's triangle is an optical illusion. You can quite clearly see the white triangle, yet it simply doesn't exist — it is only suggested.

Caroline Brodie



Frank Spooner Pictures

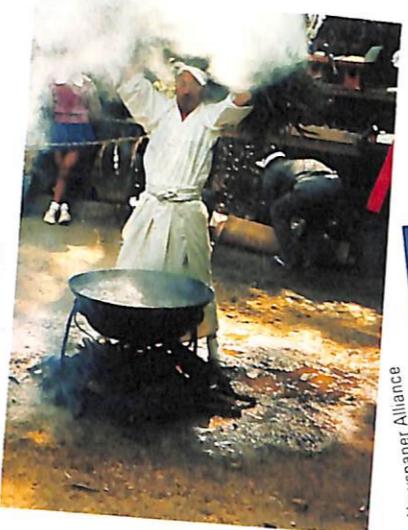


Paul Raymond

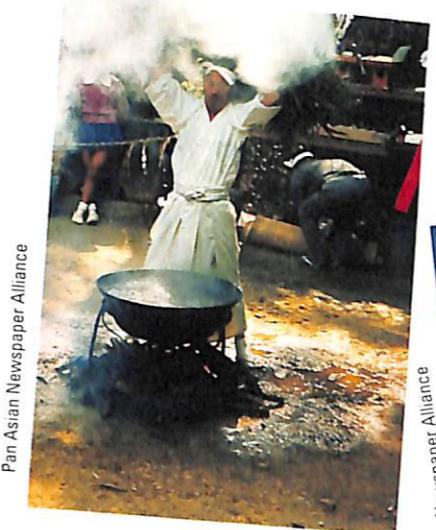


Ian Turner/Rex Features

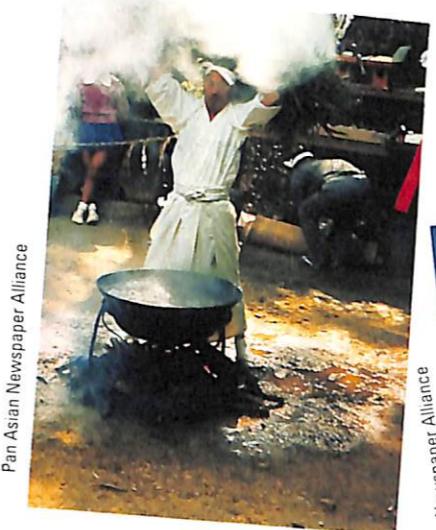
The ladder of swords needs balance — although razor sharp, the swords cut only if the feet slide sideways.



Pan Asian Newspaper Alliance



Pan Asian Newspaper Alliance



Boiling water splashed in the air by the Japanese priest is not dangerous — the water is only boiling at the sides.

Perhaps the most famous was a horse called Clever Hans, who performed at the beginning of this century. When people gave Hans a sum to work out, the horse tapped out the answer with its hoof. He also seemed able to read and spell. A horse that could really do these things would be a wonder indeed, so a psychologist set out to test it. The results of his test were extremely interesting.

Horse sense

When the questioner didn't know the answer, Hans didn't know either. Even if someone knew the answer, Hans couldn't reply until he could see that person. The answer was easy to find, in fact the questioners were giving the horse signals without realizing it. When the questioner looked down at Hans' hooves, the horse would begin tapping. When Hans reached the right number of taps, the questioner

GREAT MAGICIANS

In the world of magic, American **Mark Wilson** is probably the greatest all-rounder. Not only has he performed before more people than any other living magician, but he has acted as a magic consultant to many successful TV series, written a best-selling book, designed a great number of impressive new illusions and created an innovative approach to sales and marketing.

Wilson is famed for his fun and highly original illusions involving his wife and assistant, Nani. In one trick she is passed through a solid sheet of glass (right). In another, she is divided into two in a model train, then the two halves of the train separated and moved around the stage while she continues to wiggle her feet and wave her hands.

He is unusual among magicians for his preference for performing on television. His first nationwide show, *The Magic Land of Allakazam*, set the standard for all future TV magic. In it Wilson always performed in front of live audiences and never allowed a camera to

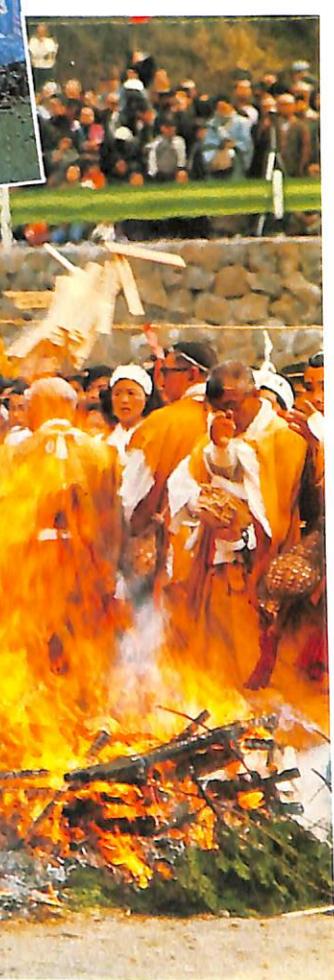


cut away during a trick.

Wilson's expertise was employed to great advantage on successful American TV shows such as *The Incredible Hulk*, *Columbo*, *The Six Million Dollar Man* and *Charlie's Angels*. He went on to play a major part in the series *The Magician*, advising on story lines, supplying props and tutoring the star, Bill Bixby.

In 1988 he was presented with the 'Masters Fellowship' from the American Academy of Magical Arts — magic's highest honour.

Fire walking requires no special powers or faith in the supernatural. Although temperatures in the pit may be 700°C or more, the coals do not conduct the heat well and a brisk step will avoid pain or injury.



Pan Asian Newspaper Alliance



would look up – and that was Hans' cue to stop tapping. If the horse got no cue, he would carry on tapping.

Weight change

The next time you see this trick performed, you will know how it is done. Someone sits in a chair, and four volunteers are asked to try and lift him with their fingertips. One places a finger under the person's left armpit, one places a finger under the right armpit, one places a finger under the left knee, and the fourth places a finger under the right knee. But the person is not easy to lift.

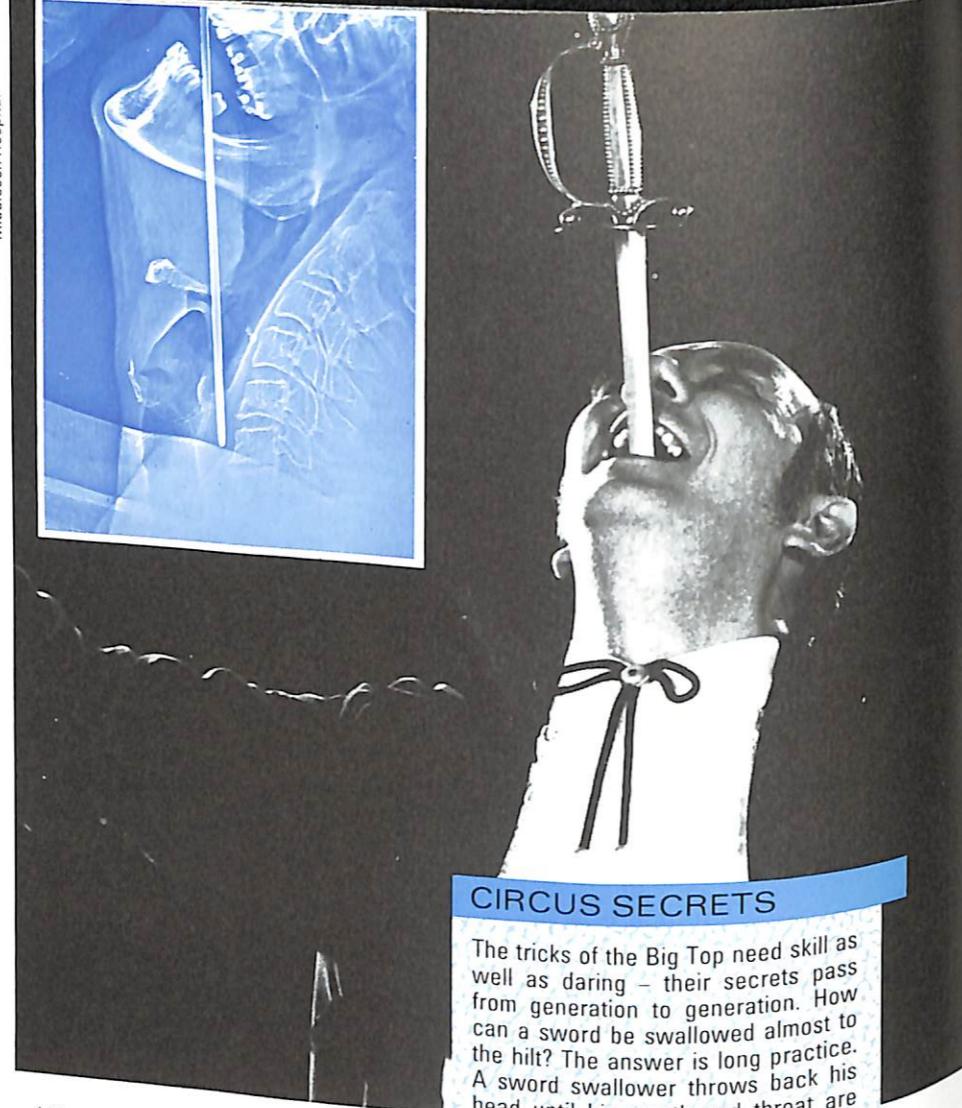
Then something 'magical' is done, such as pushing down on the person's head for a few moments, or saying Abracadabra and now the same four fingers lift the person off the chair fairly easily. How has the person's weight changed?

It hasn't. At the first attempt, the volunteers are given the impression that it's unlikely that a mere four fingers can lift someone. They don't try very hard. The subject is also likely to let his or her knees stay fairly slack and this can let the lifting movements spread in sideways directions.

Muscle power

On the second attempt, the helpers really try hard to succeed and the volunteer usually helps by sitting stiffly. In fact they could have lifted him this way at the first try.

Incidentally, they don't really use just four fingers. The muscle power of the entire arm does the lifting, the finger just happens to be at the end of it.



Would anyone in their right mind lie on the points of a row of nails driven into a wooden plank? How can it be done without injury?

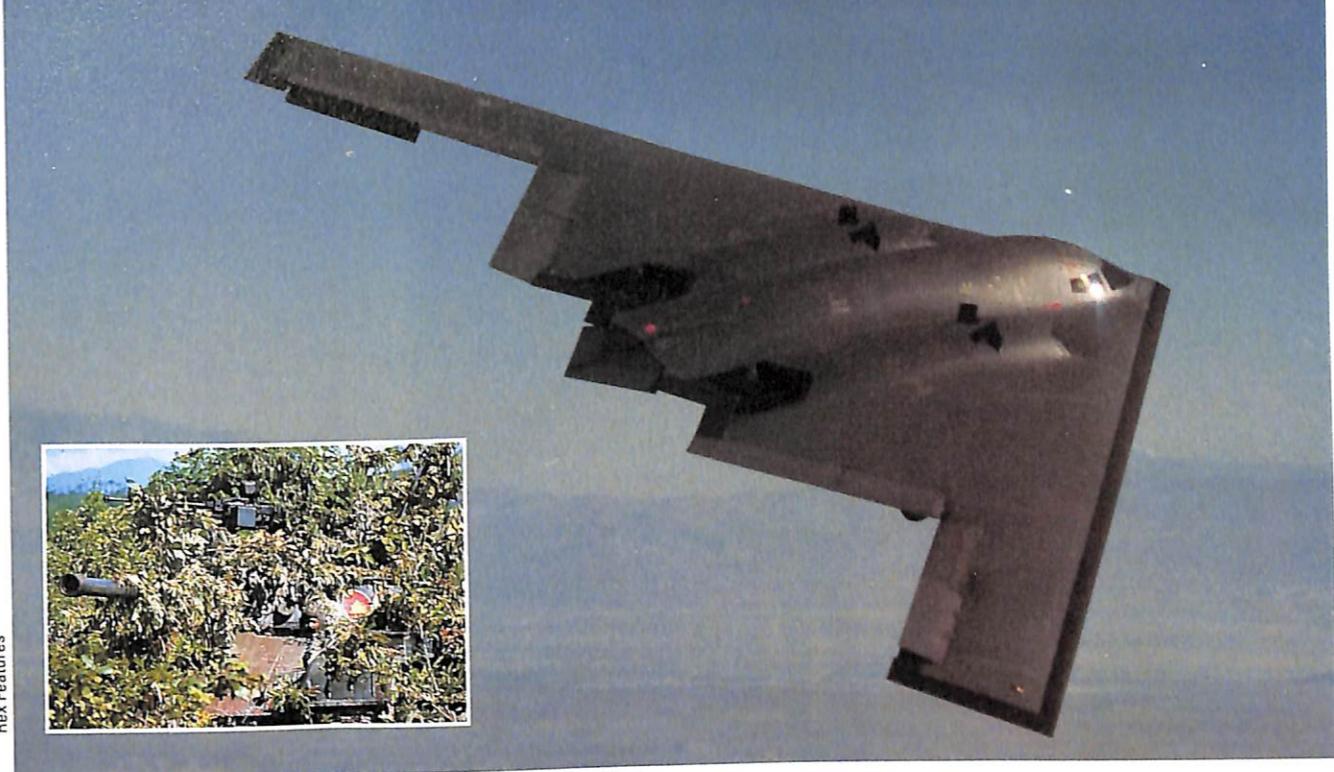
It seems surprising because people think that the weight

The tricks of the Big Top need skill as well as daring – their secrets pass from generation to generation. How can a sword be swallowed almost to the hilt? The answer is long practice. A sword swallower throws back his head until his mouth and throat are in a straight line. The edges of the sword must not be sharp, although the point may be. Also, the sword must be just the right length to reach his stomach (see X-ray inset) but no further.

The amazing skills of the fire-eater are even more terrifying – but there are many tricks of the trade. White pine, for example, does not burn like charcoal and can be easily picked out of a blazing brazier by the performer. To become a human flame-thrower a fire-eater fills his mouth with petrol or lighter fluid and holds a flame in front of his mouth. Then he blows out the liquid through his teeth to produce a fiery spray. When he puts the burning torch into his mouth, it goes out immediately because of the lack of oxygen.

of a man's body must drive the points into his flesh. The secret is simply the very large number of nails that are actually used when this feat is performed. The more there are, the more they spread the man's weight. Suppose the man weighs 70 kg. With 10,000 nails, each nail supports a ten-thousandth of his weight. That's 7 grams – the weight of a 2p coin. If there was

Andrus' Illusion photocopy, then cut it out and place it on a record player at 33 1/2 rpm. Look at the centre for 20 seconds, then look at the back of your hand



Military camouflage depends on optical illusion (inset). But the new US B-2 bomber has been designed to be invisible to enemy radar.

only one nail – now that would be surprising.

Many illusions are used in the world of entertainment, some are just optical illusions but other 'tricks' can have serious effects. If you expect to see a certain thing, then you will see it. This sometimes causes accidents. When a train driver has always seen a green signal light at a certain place on the route, he may think he sees green even if the light shows red one day.

Similarly, pilots have refused to see unexpected nearby planes.

In wartime, everyone wants to deceive the enemy, and in World War II optical illusions played an important role. Britain set up a network of optical illusions on which enemy bombers wasted their explosives. Dummy docks and fake airfields, factories and shipyards were created out of chicken-wire, wood, paint, canvas, and fibreboard. Rubber tanks were inflated with compressed air, and two-wheel trailers drove around creating false tank-tracks. Enemy plane crews, seeing the clues, would attack empty fields or beaches.

DESERT MIRAGES

The heat is fiery – the sand shimmers and suddenly water is seen – fact or optical illusion? The explanation is scientific. Hot sand heats the air just above it, so that this air becomes less dense. Light from low in the sky far ahead of you enters this heated air and doesn't quite reach the ground – the light is bent upwards and reaches your eye. This image of the sky shifts and shimmers in the heat and looks like the rippling of water. You can see the same rippling on a long stretch of hot road on a summer's day.

THE KNOT THAT TIES ITSELF

ABRACADABRA



▲ Take a handkerchief and hold both ends in one hand. Then, with a flick of wrist unfold it to reveal one end. There's no knot. Do this once more.

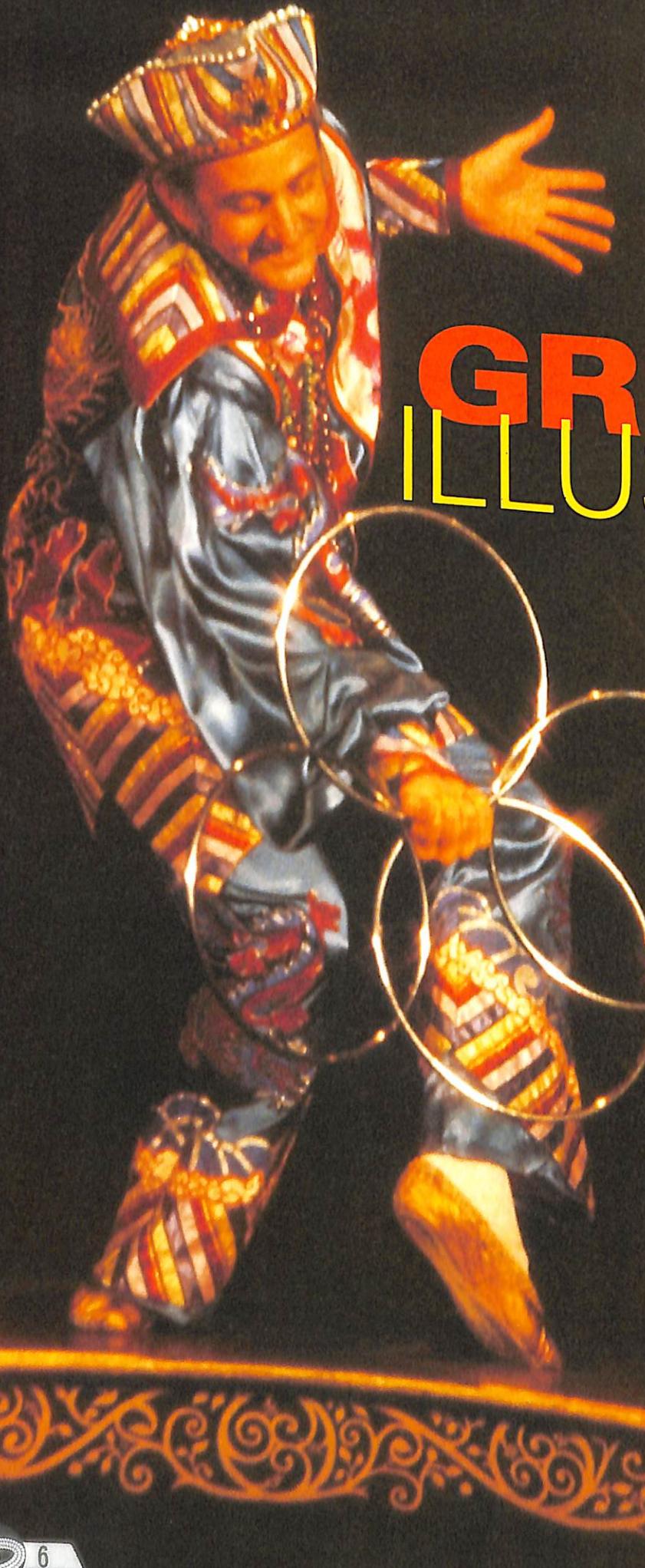


▲ The secret, as always, is simple. A loose knot has already been tied in one corner of the handkerchief – but this is concealed in the hand.



▲ Having revealed the unknotted end twice it appears that your trick has failed. Flick your wrist and let the knotted end fall and reveal itself – it's magic.





- THE DIVISIBLE LADY
- WALKING THROUGH WALLS
- THE GREAT ESCAPES

GREAT ILLUSIONS

GUARDED RELIGIOUSLY BY the few daring enough to attempt them, there are certain tricks that are so difficult, so extravagant or – apparently – so dangerous to perform that they are known as the Great Illusions.

Of all the Great Illusions perhaps the most incredible is Sawing a Lady in Half. In a recent television broadcast, American magician David Copperfield, was 'cut in half' with a large circular buzz saw. He could be seen throughout the performance, lying completely uncovered on top of a table, which was pulled far apart, with his head and body on one half and his legs and feet on the other. How is this possible? We can only guess...

One of the most popular methods known for this illusion uses a small frame, which is fixed around the waist of the magician's assistant to guide the saw blade away from her body.

The earliest attempts were clumsier – two boxes were used and two ladies, one of whom the audience knew about and another who was concealed in the box. When the two halves of the box

The Chinese Rings is a classic magic illusion. Apparently solid rings are linked and unlinked in an endless variety of ways.

- THE DIVISIBLE LADY
- WALKING THROUGH WALLS
- THE GREAT ESCAPES



Mary Evans Picture Library

The Rope Trick, although seldom performed, is by no means a myth. A boy climbs a rope, made rigid by the magician, then disappears.

Harry Houdini was a master showman, world famous for his daring escapes. Yet he rarely exposed himself to any real bodily danger.

to be in a trance, first the stool, and then one broomstick is removed. The magician swings her feet out to head height and she remains suspended horizontally in the air, supported by just the broomstick.

In another version, an assistant – or even a member of the public – lies on a board which is supported by the backs of two chairs, one of which is removed.

Levitations

Levitations don't have any support whatever. A simple levitation has the assistant on a board supported by two trestles, both of which are removed. A more complicated effect has the assistant rising up in the air, sometimes more than three metres. A solid hoop can be passed over the person being levitated to show that no strings or other support are used.

A hundred years ago, travellers to India returned with stories of great Indian magic. The most famous was the Indian Rope Trick, performed in the open, in which a magician threw a rope into the air where it remained suspended. A boy climbed the rope and disappeared to reappear a few moments later from behind the audience.

Following refusals by the boy to come down the magician took a knife and climbed the rope. He, too, disappeared. Shortly after, parts of the boy were seen and heard dropping to the ground. The magician climbed down the rope, picked up the pieces of the boy and put them in a basket. Moments later the complete boy emerged to the complete astonishment of the crowd.

Modern magicians can perform a similar effect, especially in theatres.

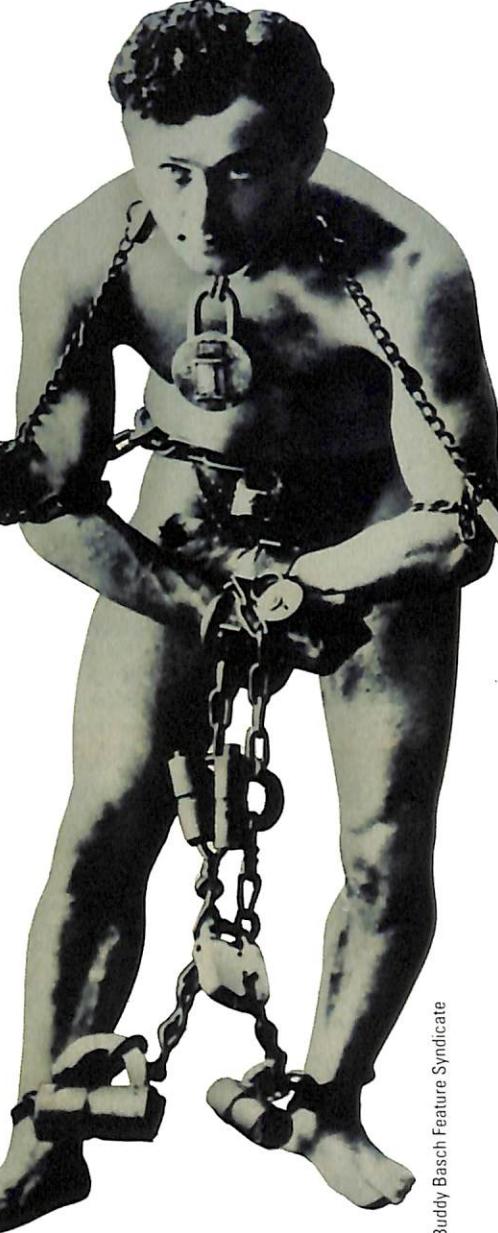
Optical illusions are a speciality of American magician, Jerry Andrus (left). The nuts are 'solid' only when viewed from one particular position.



Thames TV



Jerry Andrus



Buddy Basch Feature Syndicate

but no one – either Indian or European – has been able to demonstrate the Rope Trick in the way that travellers claim to have seen it done. But there are theories.

One explanation is that the magician uses a special rope with a hook fixed to one end. This hook has several prongs, kept hidden in the coil of the rope. The other essential is a strong thin wire stretched above the fakir's head. The show takes place just before sunset, with the audience placed so that they face the sunlight – they cannot see the wire in its glare. It is easy, then, for the rope to be hooked on and off the wire and for the boy to slide along it and down a convenient tree to the ground.

Cover of fog

Another explanation of the trick is that it was performed in a tropical valley, where fogs form a dense mist 7–10 metres above the ground. The boy could then have 'disappeared' under cover of the fog. More likely, perhaps, the audience were seated on a veranda with



Chris Callis/Contact/Contact/Contact
a low roof or overhanging awning that hid the essential wire. In this version the boy could have climbed over the roof to reappear on cue.

Sawing a Woman in Half is a classic illusion, but Siegfried and Roy perform an incredible variation with the woman completely visible.

Metamorphosis

An illusion known as Metamorphosis or The Substitution Trunk Mystery has been performed by many magicians who use an assistant. The performer is chained, tied into a sack and locked into a trunk. The assistant stands on the trunk and raises a hooped curtain above her head. The magician changes places with the assistant, who is subsequently found tied-up in the trunk. Quite often, both magician and assistant have also changed into different clothes.

With substitutions, the audience knows when, if not how, the change is made, but with transpositions they are taken completely by surprise. The Japanese performer Shimada and his wife Deanna perform their own unique transposition. After putting on a ritual mask and waving a Samurai sword, Shimada 'fights' someone dressed in

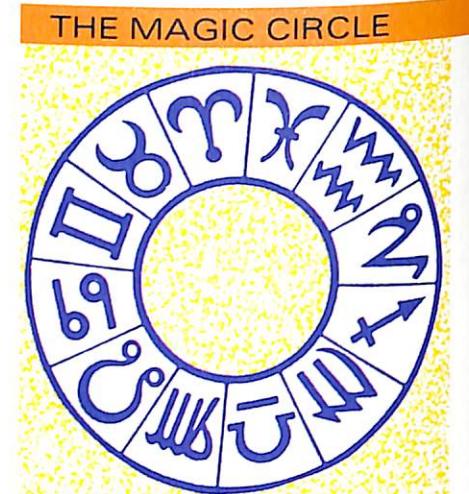
the costume of a multi-coloured dragon.

To the sound of dramatic Japanese music, the dragon, breathing flames, encircles Shimada. Finally, he overcomes it and it 'dies'. The dragon's head is lifted off with a flourish to acknowledge the audience's applause. It is Shimada! And and sword.

Solid through solid

Passing a solid through a solid is impossible – unless you are a magician. They can seemingly pass objects and animals through glass, wood, and metal.

With practice, a magician can demonstrate his ability to link and unlink large solid rings. This trick is a classic of magic and is known as the Chinese Linking Rings. It is still a favourite of magicians who invent

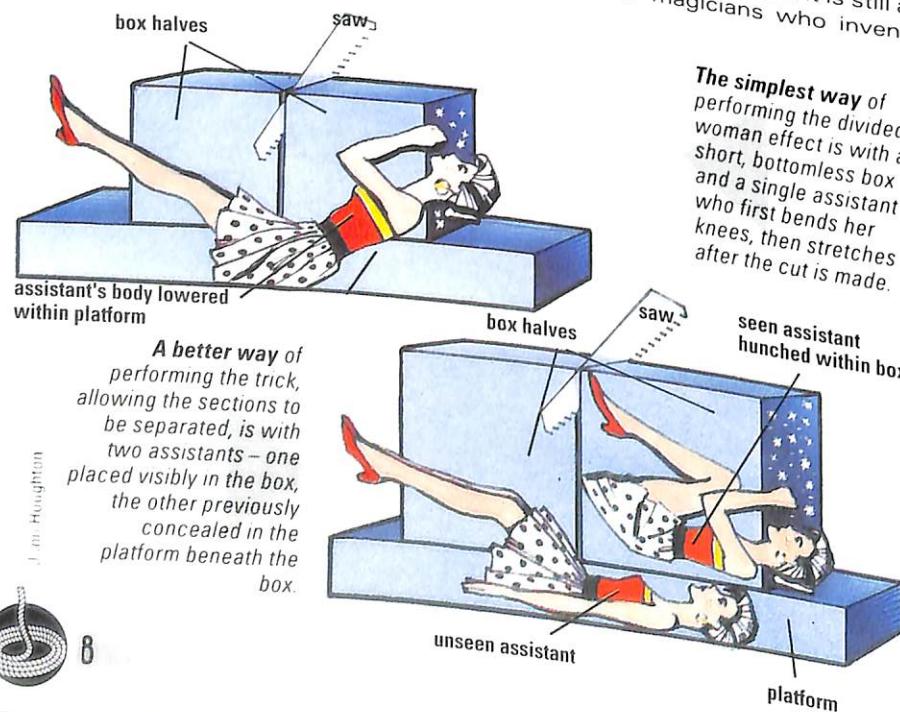


Almost every major city throughout the world has its magic society. The most famous of these is The Magic Circle, formed in 1905, which meets in London. Its first President, acknowledged by many to be England's greatest magician, was David Devant.

The Magic Circle's emblem consists of the signs of the zodiac coupled with the motto 'Not apt to disclose secrets' – a motto members take very seriously indeed! Membership today is approximately 1,500. Examinations are held to enable members to achieve various degrees up to the highest – Member of the Inner Magic Circle.

The Magic Circle meets every Monday night for shows, lectures and demonstrations. It has reference and lending libraries as well as a fascinating museum.

The Magic Circle



Just amazing!

FASTER THAN THE EYE

THE FASTEST MAGICIAN IS PAUL RICKSECKER WHO PERFORMED 91 TRICKS IN 2 MINUTES 12.5 SECONDS AT THE 57TH ANNUAL MAGI-FEST, IN COLUMBUS, OHIO, USA – A TRICK EVERY 14 SECONDS



Paul Raymonde



GREAT MAGICIANS

pushed a spectator through the glass into a display cabinet, without damaging either the glass or the spectator.

Vanishing

Of all the great illusions, Vanishes and Productions give rise to some of the most impressive performances. In one of his earliest television shows, David Copperfield 'vanished' a Ferrari motor car. The next year it was an executive jet that was completely surrounded by people from the audience. The largest item 'vanished' by any magician is the Statue of Liberty. This feat was achieved by Copperfield in the early 1980's. Each of these disappearances was done by making use of different secrets that are known only to the professionals. Yet another technique was used to make Stonehenge disappear in Jeremy Beadle's television show.

MAGIC TERMS

Apparatus: equipment used in a performance

Close-up magic: tricks performed at very close quarters

Effect: what the audience appears to see, as distinct from what really happens

Force: making a spectator select a particular card, number or colour

Gimmick: gadget that enables you to perform a particular trick

Illusion: large-scale trick done with people, animals or large objects

Levitation: making an object or person float in air with no apparent means of support

Misdirection: the act of distracting the audience's attention away from the secret part of the trick

Palming: keeping something secretly concealed in your hand

Patter: what the magician says while performing. It can be serious or funny and is often used as misdirection

Penetration: the effect of one object passing through another

Production: making things appear from thin air, or from apparently empty containers

Servante: secret pocket or shelf behind a table or chair

Shell: hollow imitation of a solid object such as a block of wood or billiard ball

Sleight-of-hand: magic done by manipulating objects with the hands

Vanish: the opposite of production



Allan S Adler/Photoreporters



Rex Features

In 1976, when he was only 20 years old, David Copperfield was so highly regarded that he was included in a book about the world's greatest magicians. Since that time he has achieved even greater fame by starring in annual television specials in the United States which have been shown all over the world. In these programmes he has 'escaped' from Alcatraz Prison, made an executive jet disappear and even 'vanished' the Statue of Liberty.

Copperfield's performances are presented as mini-dramas, often using parodies of well-known characters. As

A trick rarely seen today is Walking Through a Brick Wall. A solid wall is constructed on the stage and screens are erected on both sides of it. The magician raises his hands above the screen on one side, then a second or two later, they are raised on the other side.

The Great Wall

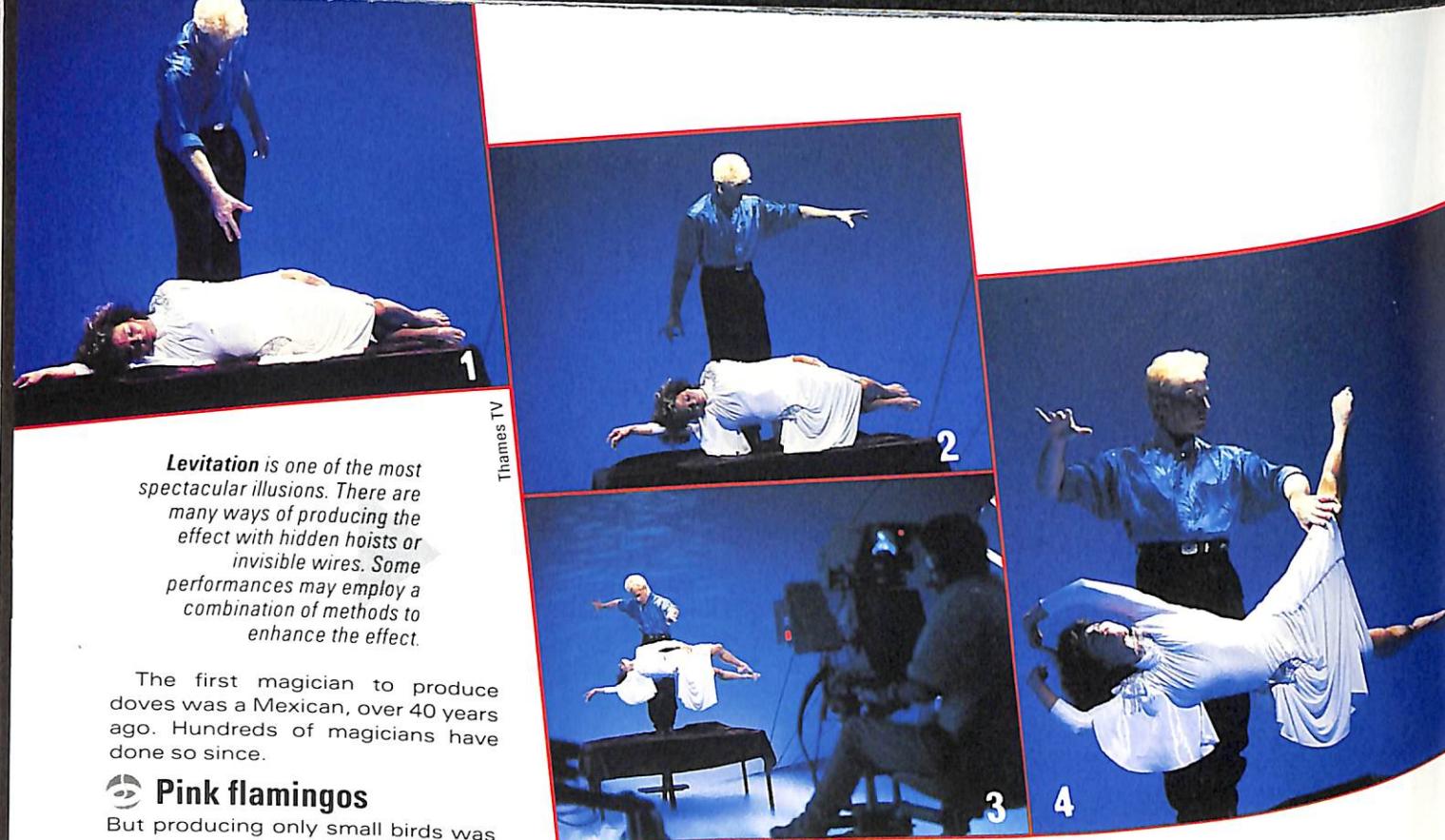
Taking this idea many steps further, David Copperfield went to China and 'walked' through the Great Wall, which is 7–10 metres thick!

Magicians love to convince an audience that their tricks are impossible by using the most 'solid' of materials. What could be more impenetrable than glass? It is impossible to fix a trapdoor in it. Even so, Canadian performer Doug Henning climbed through an 'invisible' hole in a previously examined mirror and Siegfried and Roy passed an eagle through one.

In his television show Beadle's Box of Tricks, Jeremy Beadle slowly

Trussed up with 60 metres of rope and wrapped in a heavy blanket, Karl Bartoni frees himself while suspended from Britain's Blackpool Tower.

Just as with solid through solid illusions the use of living things makes a Vanish or Production more exciting and more astounding. Although David Copperfield made his Ferrari disappear, there is always the suspicion that it wasn't real. Perhaps it was collapsible? It wasn't, but with a live animal or person that question never arises.



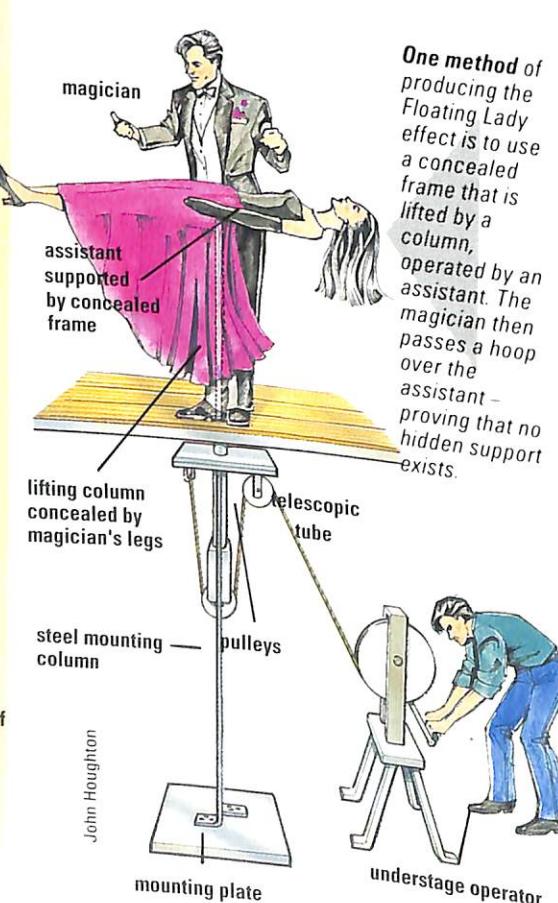
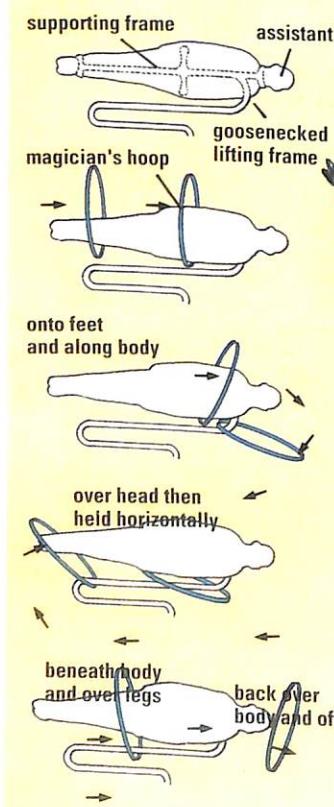
Levitation is one of the most spectacular illusions. There are many ways of producing the effect with hidden hoists or invisible wires. Some performances may employ a combination of methods to enhance the effect.

The first magician to produce doves was a Mexican, over 40 years ago. Hundreds of magicians have done so since.

Pink flamingos

But producing only small birds was not good enough for American performers Siegfried and Roy, who astounded a Las Vegas audience when they walked to the centre of the stage of the MGM Grand Hotel and produced pink flamingos from long feather boas which they had removed from two showgirls. Covering a glass-sided cabinet with a large cloth they then produced ten more flamingoes.

One of the most incredible disappearances using an animal was



John Houghton

CATCHING THE BULLET

A 'damn-fool trick' was how the great American magician Harry Kellar described catching the bullet – and with good reason. Many magicians have been killed or injured when attempting this most dangerous effect of all. In it, a previously marked bullet is caught by the performer, sometimes in the hand, sometimes between the teeth.

Houdini planned to do the Gun Trick but listened to the warning of his friend Kellar.

Chung Ling Soo was the most famous victim. He died because gunpowder seeped from a fake chamber in his rifle to the barrel containing the marked bullet and fired the bullet. Another infamous accident befell a Dr Epstein, who died in Paris when a piece of wand that was used as a ramrod, and should have secretly removed the lead ball in a pistol, broke off in the barrel and killed him when fired.

Genuine Escapes are performed by magicians known as escapologists. Other magicians and stunt-men also demonstrate Escapes, but these are always done using fake shackles and props. Trained escapologists, however, can also get free from real locks, and even jails.

Escapology

The famous Houdini usually used fake locks and trick boxes when doing publicity stunts in which he had to escape from under water. He was no fool and kept the risks to an absolute minimum. But he was quite capable of freeing himself



Frank Spooner Pictures

Aerial escapology is a new twist to an old trick. In September 1988 the American performer, Todd Anthony Martin, escaped from a cage suspended from an aeroplane, then parachuted down to earth.

from locks supplied by other people – his famous handcuff escape at London's Scotland Yard was genuine enough.

In one of his jail exploits, Houdini escaped from one cell, unlocked the door of the cell containing his clothes, then proceeded to change prisoners around in other cells.

The last great escapologist was James Randi, a Canadian who now

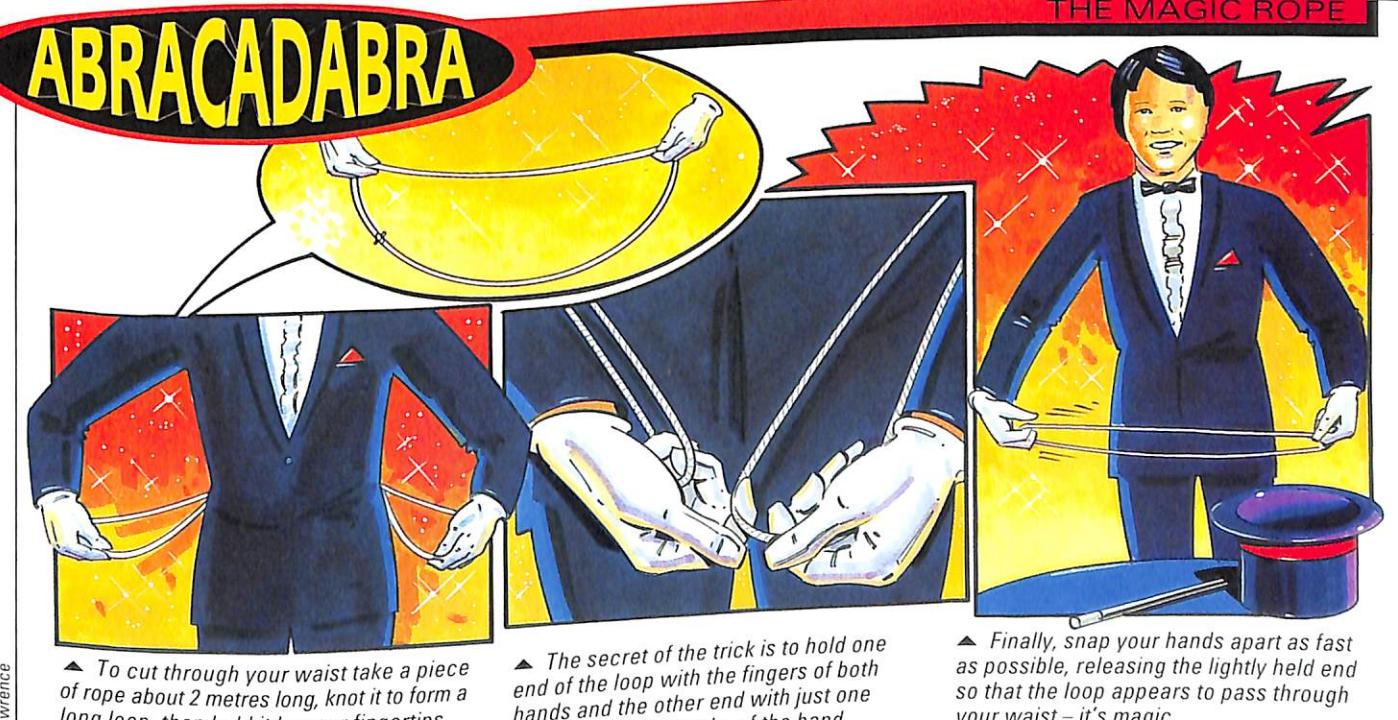
exposes fake psychics – just as Houdini did. In his 28th (and last) jail break, Randi was fastened in two pairs of double-locked police handcuffs, a pair of special-issue handcuffs with pin-tumbler locks and a pair of leg irons.

Jail break

He was then locked into a maximum-security jail cell. In 13 minutes, without assistance of any kind, he walked from the jail cell – minus the handcuffs and leg-irons.

Randi has also escaped from the inside of a safe owned by a newspaper company and freed himself from a genuine straight-jacket while suspended over Niagara Falls. Perhaps most impressive, though, is his escape from a water-filled milk churn. In this performance Randi was handcuffed and helped into the milk churn. As water spilled from the top the lid was closed. Over two minutes later the lid was pushed open and a breathless Randi emerged.

THE MAGIC ROPE



Joe Lawrence

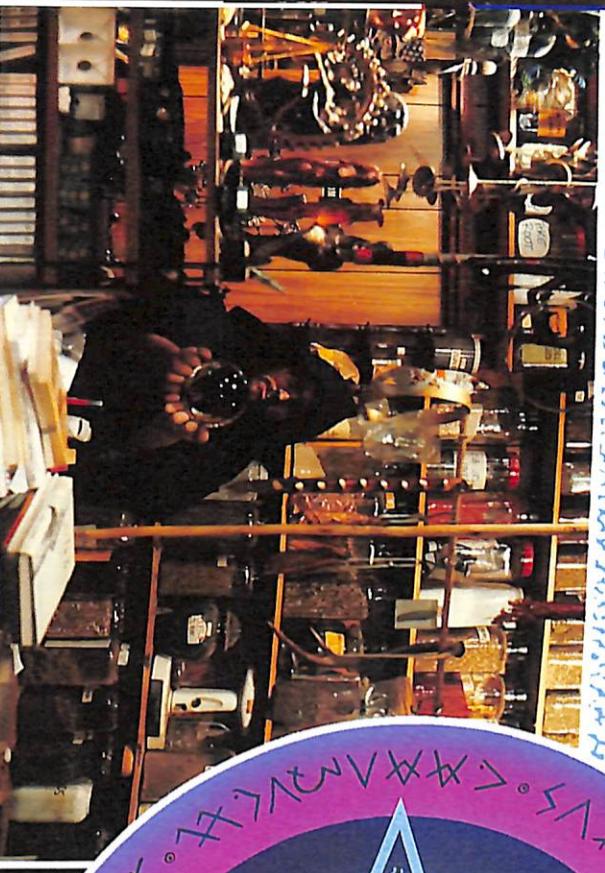
Finally, snap your hands apart as fast as possible, releasing the lightly held end so that the loop appears to pass through your waist – it's magic.





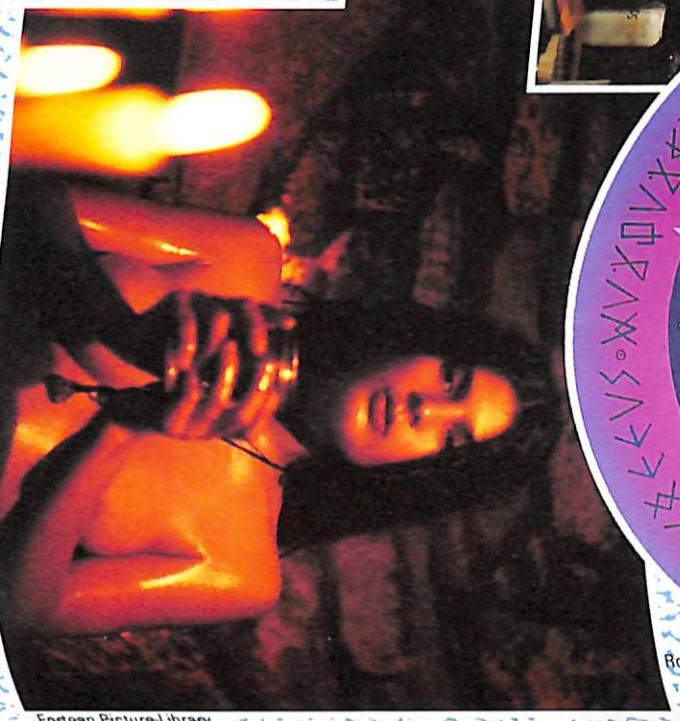
Magic potions have their basis in ancient knowledge. The highly prized mandrake root, for example, is one of the oldest anaesthetics.

Rex Features



VIEW
Witchcraft claims to be the remains of the pre-Christian religion of Western Europe, driven underground by Christianity

THE OCCULT
The horned god and the pentagram are powerful black magic symbols, used to conjure up demons and work spells.



An initiate witch undergoing the ritual scouring by a priest.

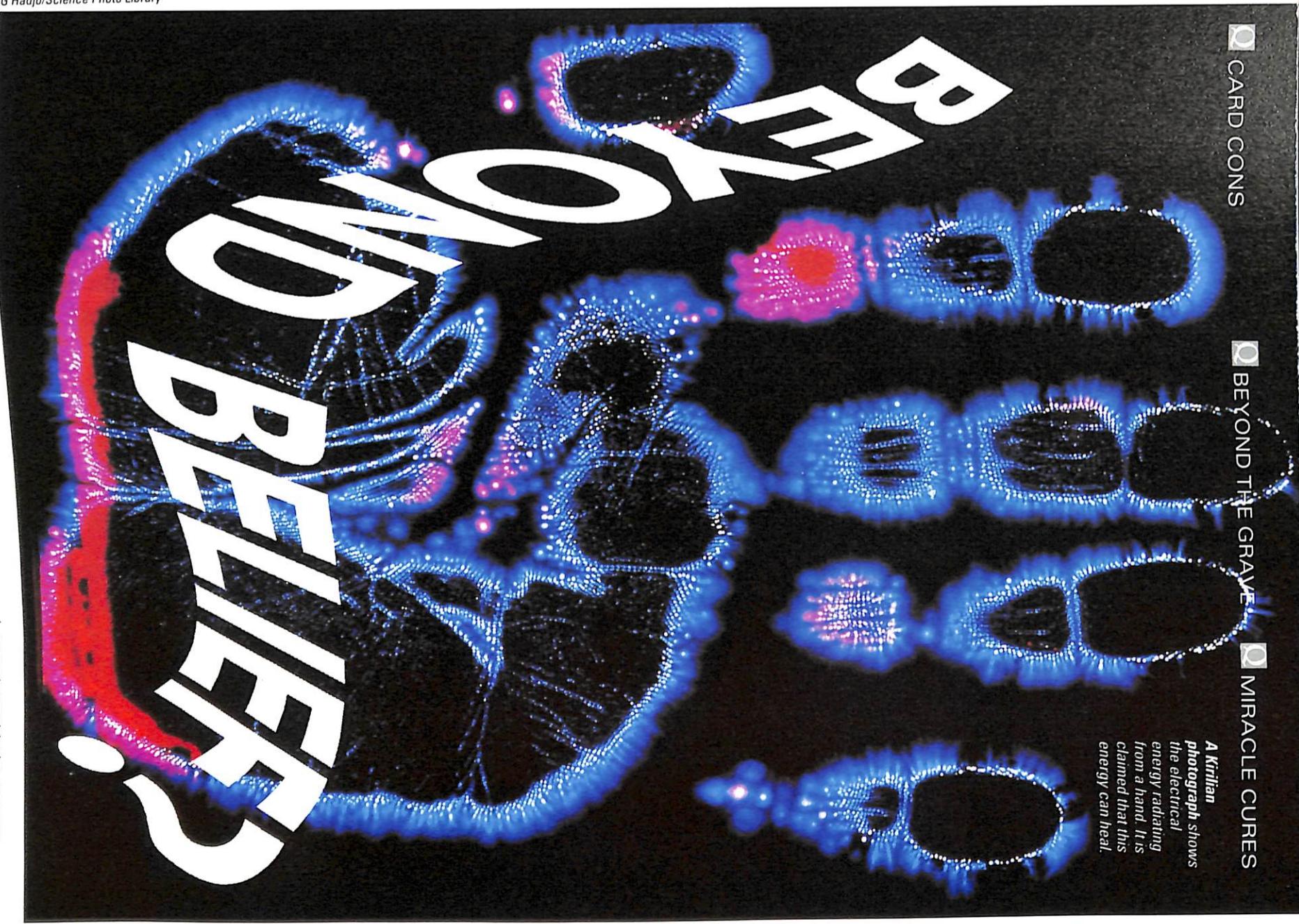
A witch taking part in the Esbat - a meeting held at or near the full moon.

Fortean Picture Library

Initiation must always be given by a person of the opposite sex and some covens still insist on nudity.



G Hadjo/Science Photo Library



ALL MAGIC, GREAT OR SMALL
is a trick. Sometimes, however, its secrets are used dishonestly to gain money, power or glory.

The most famous 'con' is the three card trick, or Find The Lady, which may be seen on city streets

all over the world. An ace or a picture card is mixed in with two others. The watchers then bet money that they can find it. Would-be-participants see other people betting and winning so they think they have a chance - in fact the other people are usually working

together with the conman. But attempts to 'find the lady' are doomed for three reasons: firstly, a skilled cardsharp is adept at misdirecting attention. Secondly, the 'lady' card often isn't on the table at all - it is usually palmed and replaced by a different card. Thirdly,

CARD CONS
A Kirlian photograph shows the electrical energy radiating from a hand. It is claimed that this energy can heal.



Rex Features

Uri Geller found fame as the man who could make metal keys, spoons and forks bend just by stroking them – and continue to bend after he had left.

Kris dancers of Bali stab themselves as commanded by a mythical witch, but are saved from injury by the stronger spell of a good spirit.

the conman only gives 'short odds'. If, for example, you bet £10, you win £10 – your stake. But in fact you should win £20 because the chances of picking the right card in an 'honest' game is one in three, not one in two.

The Shell Game

Another street show that uses the conjurer's art to rob people is the Shell Game. Here, the conman has three half walnut shells and a small ball or pea. The pea is put under one of the shells, the shells mixed up and the gambler has to decide where the pea is. But, by that time it has already gone. When the conman pushes the shell with the pea under it forward, the pea is forced out and into his hand.

UNDERSTANDING THE ODDS AGAINST

Odds 'on' are only possible where the chances of betting a winner are greater than even, say in a horse race. With two dice the odds are always against.

Score	Ways of scoring	Chance of scoring	Odds Against
2	1	1/36	35 to 1
3	2	2/36	17 to 1
4	3	3/36	11 to 1
5	4	4/36	8 to 1
6	5	5/36	6 1/5 to 1
7	6	6/36	5 to 1
8	5	5/36	6 1/5 to 1
9	4	4/36	8 to 1
10	3	3/36	11 to 1
11	2	2/36	17 to 1
12	1	1/36	35 to 1

*36 is the total number of combinations



Caroline Brodie
A 'loaded' dice has a weight concealed behind one face, ensuring the opposite face always lands uppermost.



Douglas Dickens

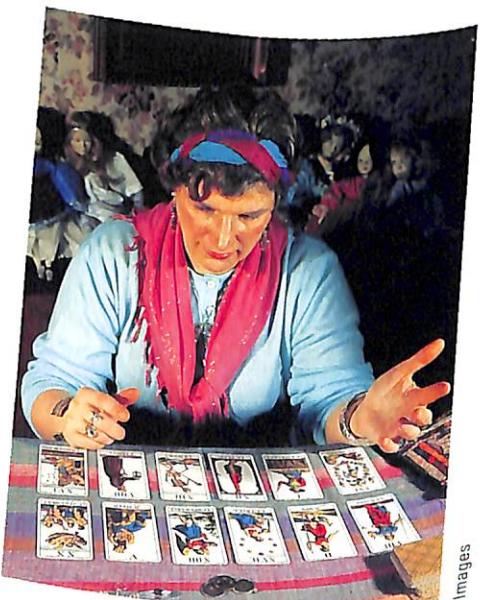
Even though both of these cons look like conjuring tricks, people still flock to lose their money on them. The only safe bet is that if something looks like a conjuring trick, it probably is!

Marked cards

Cheating at cards is as old as playing cards themselves. Marked cards make cheating easier, because the cardsharp knows exactly where they are. There are hundreds

of different types of marked cards, but most can be detected by riffling through the pack with the backs towards you, like a flick-book. This will make whatever marking there is jump around quite visibly.

Another special pack sometimes used by cardsharps is the 'stripper deck'. Each card is tapered – nar-



Images

A clairvoyant doing a tarot reading. The tarot cards are said to contain universal truths, knowledge and wisdom in a form transcending language.

Physical mediums demonstrate psychokinesis – the power to move objects, such as this table (right) and can allegedly spew forth ectoplasm – spirit material.



Mary Evans Picture Library



Mary Evans Picture Library

make people cut the pack where he wants. What he does is to 'bridge' a card, by making a slight bend in it, then put it where he wants the pack to be cut. Most of the time the pack will cut naturally at that point.

Some cardsharps use 'shiners' – objects with mirror-like surfaces – and hold the cards face-down over them so that they can see what cards they are dealing. Others will keep a card palmed, adding it to their cards when they need it.

False shuffle

A skilled 'sharpie' can deal cards from the bottom or even the middle of the pack as though they are coming from the top. He will also know how to false-shuffle – apparently mixing the cards but really keeping them in the same order. In this way he can get a winning hand whenever he desires.

In spite of the rigours of science,

rower at one end than the other. By having the cards he wants turned around, the skilled cheat can always find them again, even if the deck has been shuffled.

Confidence

Usually, the cardsharp doesn't want to win all the time, he just wants to build up confidence. He often pretends to be a poor card player and will let his fellow players win a few games before he starts cheating. Knowing where one card is, or being able to put it where it is wanted, is an all-important factor.

It helps the cardsharp if he can

Faith healing often involves the 'laying on of hands' – the healing power of the practitioner being transferred directly to the patient.



there are phenomena that remain beyond the realm of mankind's knowledge. Such things are known as the supernatural. The area of the greatest interest is perhaps the spirit world, through which many people seek comfort, reassurance or knowledge.

The mediums

The most famous British medium was the late, Doris Stokes, a 'clairaudient' who heard messages from the dead. Her extraordinary powers were demonstrated time and time again. There are, however, many fakes – self-styled 'psychics' and fake mediums – who have a battery of methods to persuade people that they have some kind of special gift.

With clever psychology, it is quite easy to cheat. A fake medium may

ON THE RIPPER'S TRAIL

Almost every major crime brings forth a host of people who believe that their 'psychic' powers can help the police. One of the most impressive was a south London woman, Mrs Nella Jones who, in October 1979, correctly identified the Yorkshire Ripper as a lorry driver called Peter who drove a cab with a name beginning with 'c' on the side. In January 1980, Mrs Jones identified, again correctly, the killer's Bradford house.

He would live, she said, in a big grey house in Bradford (although Sutcliffe's house is a pale pink colour by day, at night it appears grey in the yellow light of the street lamps). The house, she said rightly, would be elevated above the street, behind wrought-iron gates, with steps leading up to the front door. It would be number six in its street.

Then in November she predicted the date of the next Yorkshire Ripper attack – 17 November. The day that Jacqueline Hill (the last victim) was to die. Peter Sutcliffe was eventually arrested on 2 January 1981.

mix with people in the audience before the show, subtly eavesdropping on their conversations, then produce the information later as if it had come from a spirit source.

Fake mediums have also arranged for their victims to leave coats and bags where they can be searched by an assistant; the information from them is then passed on to the performers. Sometimes the information is passed on using tiny, hidden radios.

The most important way of cheating, however, is called 'cold reading', that is using a mixture of factors that apply to everybody, guesswork, 'pumping' the victim for information, and carefully-phrased questions.

For instance, a medium or a



GREAT MAGICIANS

The two most spectacular present-day magicians are *Siegfried and Roy*, who appear regularly in Las Vegas – the entertainment capital of the world. A wide selection of exotic wild animals are used for astonishing 'appearances' and disappearances'.

They have made a three-tonne elephant disappear from a platform that had been lifted several metres in the air. Through a gap at the bottom of the curtain, the feet and legs of the elephant could be seen up to the last second before it disappeared. Another illusion used a Brahma bull, which was ridden by Roy into a large cabinet with a see-through front. The audience saw the complete bull in the cabinet until the moment it disappeared.

Siegfried and Roy own a number of big cats which they use in their act and which they keep with them at all times. Among them is a cross between a leopard and a jaguar – a lepjag – bred by Roy. The animal is used in an illusion in which Roy and the lepjag are loaded into a large cannon aimed at a box suspended by ropes on the other side of the stage. Between the cannon and box is a large sheet of glass. When the cannon is fired, the glass shatters. The box is lowered to the stage and Roy and the lepjag are found inside.

psychic will ask a double-edged question such as: "He didn't buy a green car, did he?". If the victim says "No" the psychic might say: "I didn't think so, because green wasn't his favourite colour, was it?" and so on. If the answer is "Yes" the reply will be something like: "Yes, I thought he did, because he was very attracted to it". Individual clients or members of an audience go away, convinced that no questions were asked, yet they give most of the information themselves.

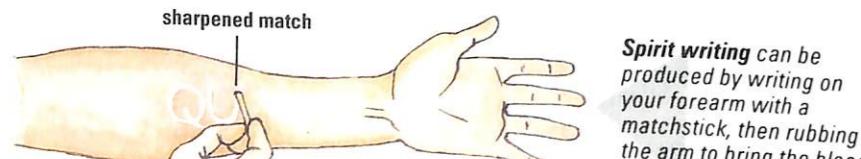
What happens if you are wrong? You can always suggest that the event is something that is going to

happen. A psychic will make a vague reference to "travel abroad", "a great opportunity" or even "meeting a dark stranger". If no such thing has happened, they will say: "It will, soon".

Undoubtedly, the most famous modern possessor of supernatural powers is Uri Geller whose name became a household word in the 1970s. Apart from reproducing

sharpener match

Spirit writing can be produced by writing on your forearm with a matchstick, then rubbing the arm to bring the blood to the surface.



HOT LIPS

ON OCTOBER 29TH 1977 MRS JEAN CHAPMAN EXTINGUISHED 1,921 FLAMING TORCHES IN HER MOUTH IN 120 MINUTES – ONE EVERY 4 SECONDS – FOR TWO HOURS NON-STOP

HORSE SCANDAL

Show-jumping horses have allegedly been maltreated in the pursuit of success in international competitions. Among the abuses uncovered is the practice of rubbing a caustic solution into the horse's forelegs. This induces painful blisters that make the animal avoid hitting the jumps. A hidden metal bar may be placed in front of a jump so that failure to clear the jump is associated by the horse with pain. Another trick is to tie the horse's head down to its knees 30 minutes before the competition. Its neck is left aching and it can be totally dominated.

other people's drawings by telepathic means and mending badly damaged watches and clocks. Geller is best remembered for causing metal to bend, just by stroking it.

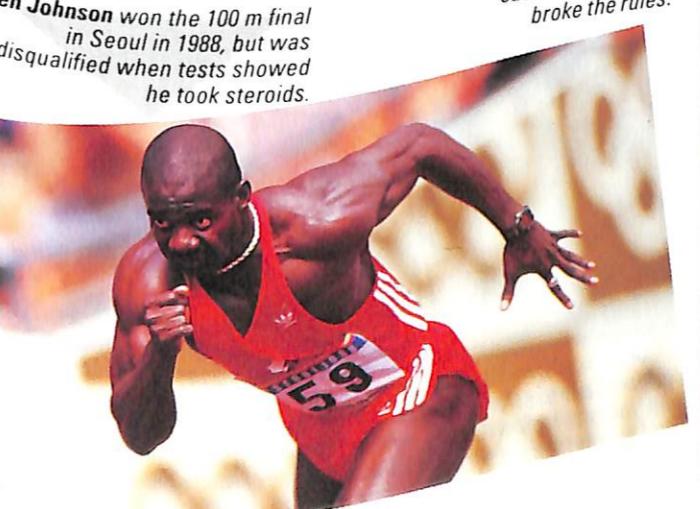
Both scientists and some professional magicians have attempted to prove Geller a fake. But although it is possible to reproduce some of his effects using conjuring techniques, others cannot be reproduced or even explained.

Metal bending

Take bending spoons. With practice and experience this can be done convincingly. The trick is to bend the spoon first, then produce the illusion that it is bending later. One technique is to hold the spoon firmly at both ends and bend it by pushing inwards and down with the wrists. This is done very quickly in a split second while the audience's attention is directed elsewhere. The performer then turns the spoon so that the bowl is hidden behind his hand and rubs the neck where the handle joins the bowl. By lowering the bowl and lifting the handle it looks as if the handle is bending.

Why does metal sometimes seem to bend? If you look at your cutlery drawer right now you may suddenly notice forks, spoons and other things that are bent. You didn't

Ben Johnson won the 100 m final in Seoul in 1988, but was disqualified when tests showed he took steroids.

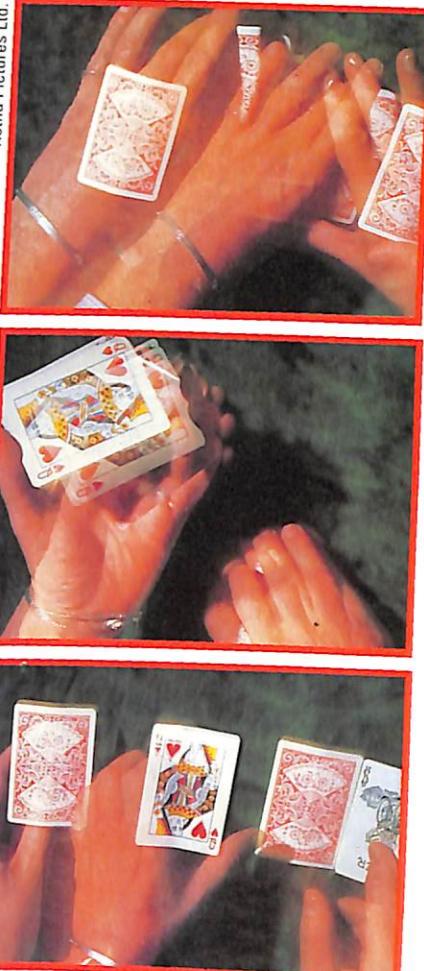


notice them before, because you didn't look for them. Also, some people have bent their own cutlery just to get their names in the papers. But how are watches 'fixed'? Usually, people are told to look for an old watch and hold it in their hands. Watches often stop because the oil inside has thickened, or because of dirt in the wheels. Warming the watch in the hands or moving it will get it working again.

How about stopping watches? First, a magnet will stop a watch when held close to it, even a supposedly non-magnetic watch. Long-distance watch stopping may work, simply because every second of the day thousands of watches stop because they weren't wound-up.

Psychic surgery
Seriously sick people will grasp at any straw in a desperate bid to regain their health. Sadly, their hopes are exploited by some tricksters such as the Filipino 'psychic surgeons'. These people pretend that they can put their hands inside the body and take out diseased tissue, such as cancer tumours.

Spot the Lady involves betting where the picture card is. A skilful cardsharp can palm the picture card – switch it for another – without the punter realizing.



The Americas Cup has changed hands three times since 1988 as lawyers try to decide whether the winning US catamaran (above) broke the rules.





When they take their hand 'out' there is no scar and the victim is supposedly cured.

Adolphus Fritz

It was all started by a man called José Arigo, who claimed that a German doctor who had died in 1918, Adolphus Fritz, was working through him.

He was made aware of his extraordinary talent when, while paying his respects to a dying woman, he rushed from the room and returned immediately with a large knife. Friends and relatives of the woman looked on with horror as he ripped off the sheet and plunged the knife into her. After a few savage twists he withdrew the knife, inserted his hand and pulled out a growth — later confirmed as



Rex Features



ABRACADABRA



THE CARD THAT REVEALS ITSELF

Every magician should know at least one card trick. Use a deck of cards that has a white border around the patterned back. Ask your volunteer to choose one.

Take the cards behind your back and, with the pack face up, turn the top card over. Turn around and instruct the volunteer to replace the chosen card.

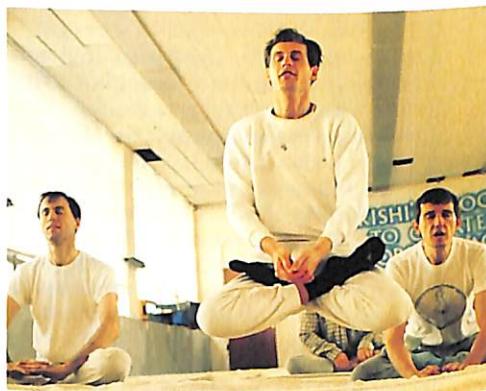
As you turn back, turn the top card over so that the entire pack is now face up. Spread the pack face down on a table to reveal the chosen card — it's magic.

cancerous — the size of a grapefruit. From that moment the woman rapidly recovered her health.

Before his death in a car crash in 1971, Arigo treated over half a million people. Although his work was hailed as miraculous, he has been followed by many tricksters who earn fortunes.

Their operations look very convincing, with lots of blood. But the illusion of putting fingers inside the body is made by curling the fingers towards the palm of the hand and pressing on a fleshy part of the victim's body, usually the stomach.

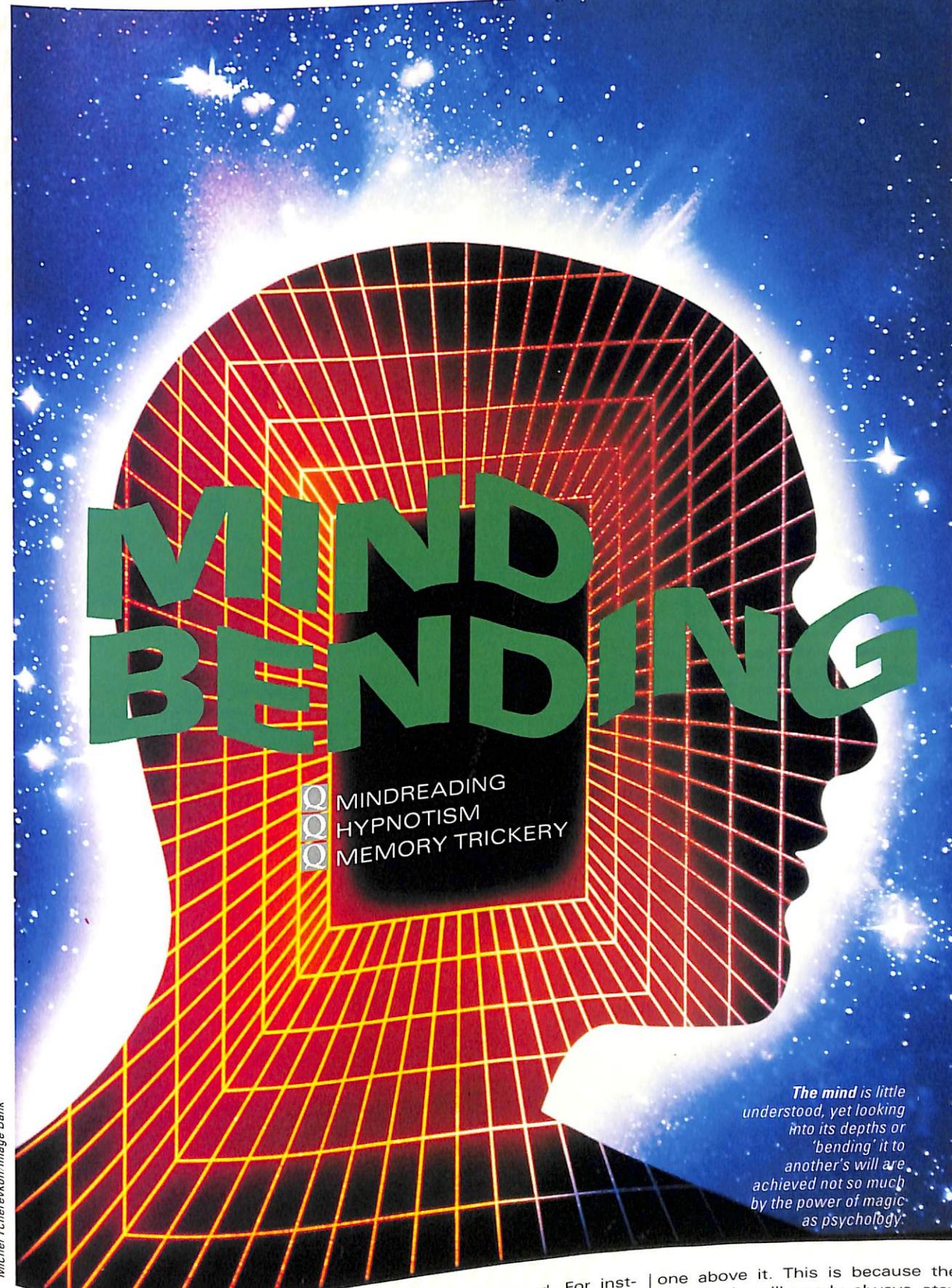
The 'cancer tumours' are usually bits of chicken liver which are pas-



Rex Features

sed to the 'psychic surgeon' by an assistant and hidden in his hand — or a conjurer's false thumb — until revealed. Chicken blood and water are also used to add to the effect.

Hundreds of people are drawn to the Philippines every year by the psychic surgeons. Many of them return home to die of the diseases that are supposed to have been cured. Significantly, very few Filipinos go to psychic surgeons.



Michel Tcherevkoff/Image Bank

WHEN THE INCREDIBLE IS performed in the mind instead of in front of the eyes, it may be the nearest to real magic there can be.

Often, the only difference between mentalism (that says the mind, not the material world is real) and, say, an ordinary card trick is

the way it is presented. For instance, if you have a pack of cards shuffled and secretly remember the bottom card, you can ask a spectator to take out a card, look at it, put it back on top and cut the pack several times. Look through the pack and find the card you remembered. The chosen card will be the

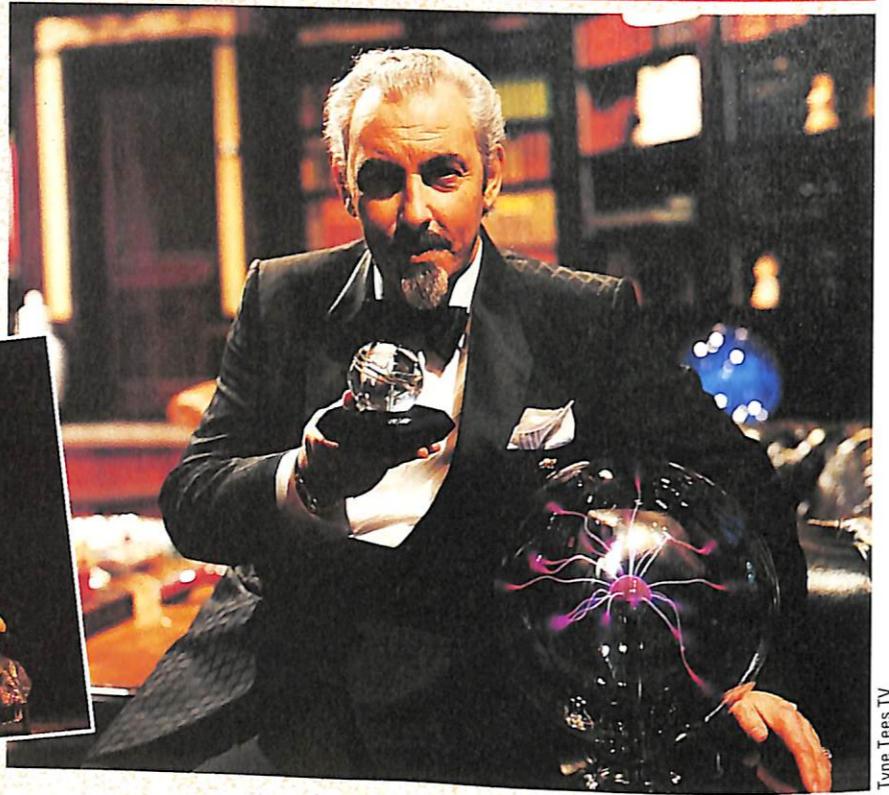
one above it. This is because the two cards will nearly always stay together when the pack is cut.

If you show the chosen card, it is just a card trick. To turn it into a 'mentalist' trick remember the spectator's chosen card and say you can't find it. Have the pack thoroughly shuffled and all the cards



THE MINDREADERS – THE MAGICAL POWER OF MEMORY

Mentalists, like illusionists and escapologists, vary greatly in the presentation of their act. David Berglas (right), for example, encourages his audience to believe that he possesses special or even 'psychic' powers. Masoni and Shan, on the other hand, have a more down-to-earth approach to their mind-reading act (below), which is in reality a relatively simple trick involving the blindfolded Shan's well-developed memory.



Mac Wilson/The Magic Circle

laid out face up, put your finger on the spectator's head and tell him to concentrate on the card. Then find the chosen card.

Some methods are only used for mentalism, such as getting the impression of a written word. Give

the paper against it, so that it can be used as a rest, and give it back with the pencil. Ask them to write down the word "for checking later", then to fold up the paper and keep it. You then take back the sleeve.

If you move the sleeve around as

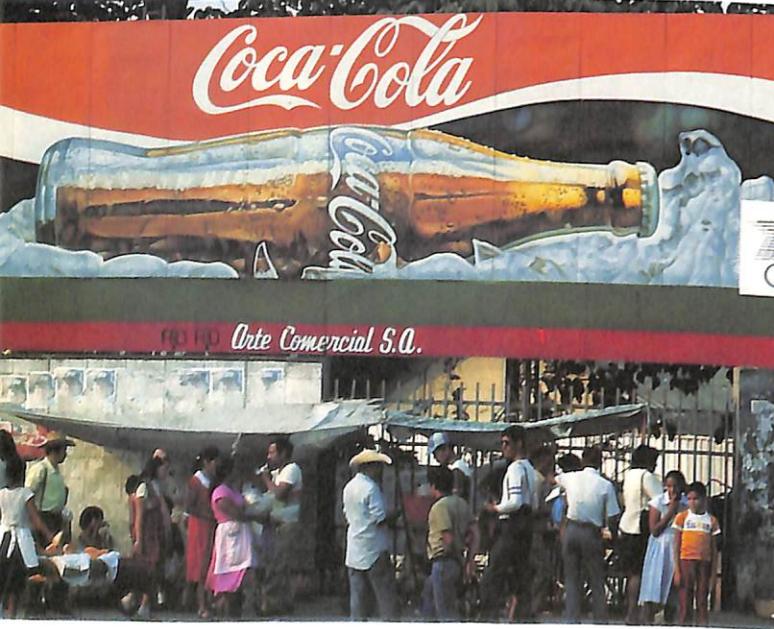
made to work in similar ways. Sometimes information is gathered from an audience before the performance, using impression devices, to be revealed later on stage.

Concealed pen

Another 'gimmick' is a concealed pen or pencil, used by magicians after a drawing, number or name has been revealed by a spectator. In this case, the performer pretends to write something down before the choice is made, while actually doing it afterwards.

A skilled magician can also 'pencil read' or 'elbow read' – getting an

Advertising is one of the most universally accepted forms of 'mindbending' – or persuasion. The image of Coca-Cola, the bottle shape and even the stylized script are recognized in every corner of the globe. Many products are harmless. But sometimes harmful ones, such as cigarettes, are encouraged.



Jenny Matthews/Format

someone this copy of *Quest* in its sleeve and ask them to look through the thousands of words in the issue, remember one and put it back in the sleeve.

Have a piece of thinnish paper and a pencil, preferably a hard one, to hand. When they have remembered the word, take the sleeve, put

you talk, perhaps about the number of words that there are to choose from, you'll be able to read the chosen word in the indentations where it was written – rather in the same way as a CD laser reads its discs.

Many devices, hidden in books, notepads and clipboards have been

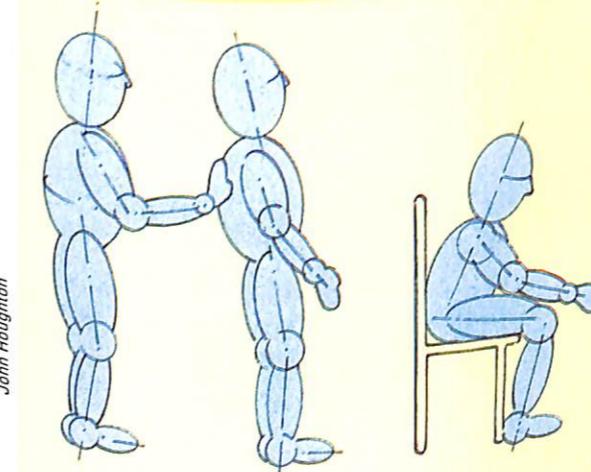
BLIND FAITH – THE DANGERS OF SPIRITUALISM



One of the most deadly 'spiritual' leaders of recent times was American Jim Jones, who used conjuring tricks to fool people into believing he had special psychic powers. Having amassed a cult following in the USA in the early 1970s he moved to Guyana.

There, in 1978, following the deaths of two US congressmen investigating the disappearances of a number of young US citizens, Jones led a mass suicide of 600 adults who also, on his orders, first murdered 300 children by giving them cyanide.

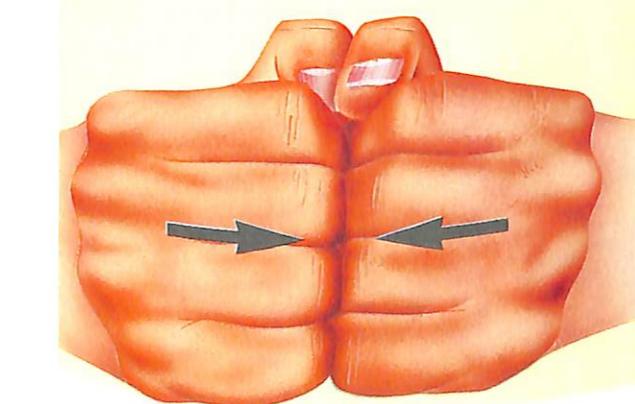
THE PSYCHOLOGY OF WILL



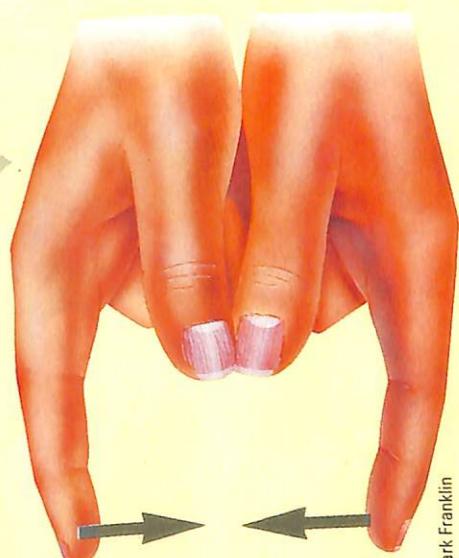
John Houghton

Mentalists can check suggestability with simple tests. In the first the subject is told he will fall backwards. He is gently pushed forwards – and pushes back to balance. When the magician's hand is removed the subject falls.

A second test is the index finger check. The subject is told to press his fists together (left) and extend his index fingers. He is told that the fingers will come together. This happens because the muscles tire even if the subject resists strongly.



Paul Raymonde



Mark Franklin

idea of the drawing by watching the movement of a pencil or the person's elbow. A small mirror hidden in his hand enables the magician to turn away while the drawing is being made, yet still clearly see the movements.

Word codes

Magicians and their assistants will sometimes use codes to send messages to each other. The method used by Houdini was to let ten words each stand for a number.

Pray	= 1	Please	= 6
Answer	= 2	Speak	= 7
Say	= 3	Quickly	= 8
Now	= 4	Look	= 9
Tell	= 5	Be Quick	= 10

Using these in combination it was possible to send numbers or, by using the words, to indicate letters. For example, Pray = A, Answer = B and so on. This way words could be

Modern word codes can identify literally thousands of individual objects within seconds. But it takes many hours of work and practice to be able to use a word code quickly and effectively.

Positional codes

Another type of code is positional. Imagine a table divided into 12 segments like a clock face. Each segment represents the value of a card (11 = Jack, 12 = Queen) while the centre of the table signifies a King. If you have a card chosen from a pack and replaced in the card case, you can 'tell' your assistant the value by placing the case on the appropriate part of the table.

To reveal the suite, have the open end of the case pointing to the left for hearts, right for diamonds, down for spades and up for clubs. With practice, the pack can be placed only slightly off centre to tip-off your assistant.

Mentalists don't always set out



GREAT MAGICIANS



Edwin A. Dawes Collection

Chung Ling Soo was in fact an American, William Ellsworth Robinson. He started playing a Chinese magician in 1900 when offered a month's engagement in Paris. He was remarkably successful in this role and toured Europe and Australia during the first two decades of the 20th century.

His most famous, impressive and dangerous trick was also to be his last. In 1918, at the Wood Green Empire, London, Soo performed the bullet-catching trick which had been a feature of his act for at least 12 years. Two members of the audience levelled rifles containing marked bullets and fired at him. On this occasion though something went wrong with the 'doctored' rifle and he was fatally wounded.

Adolf Hitler was a master orator using many psychological tricks to create a mass following for himself and plans for a greater Germany.



Bundesarchiv

to fool the whole audience – just most of them. Take the effect in which two people from the audience help the magician. The first is given a notebook and a pen or pencil and told to draw the picture of a card. When this has been done, the magician fans a pack of shuffled cards in front of the second spectator asking that he or she calls out "The name of any card you can see". The card called out is the same as that drawn by the first spectator.

Playing along

The secret is that when the first spectator looks at the notepad he sees a message – "Let's have some fun, draw the three of Spades". Many packs of cards only have indices printed in the top left and bottom right corners – fan them from left to right and all the indices can be seen, but if fanned from right to left only the front card can be seen. The magician simply arranges for, say, the three of Spades to be left on the front of the pack and fans the cards so that this is the only card the second spectator can see!

Mind games

Instead, many stage hypnotists depend on their subjects being willing to pretend they are hypnotized. The hypnotist will quietly tell the subjects what they should do and they are happy to be part of the show – pretending to see things that are not there, receive electric shocks from chairs and so on.

Usually, the performer will carry out 'tests' to see who will make suitable subjects. The volunteers may be asked to put their hands together and told they cannot pull them apart. Those who pass the test are those willing to cooperate.

Hypnotic effects

A skilled performer can persuade people that they really are hypnotized by using tests that depend on physiological effects.

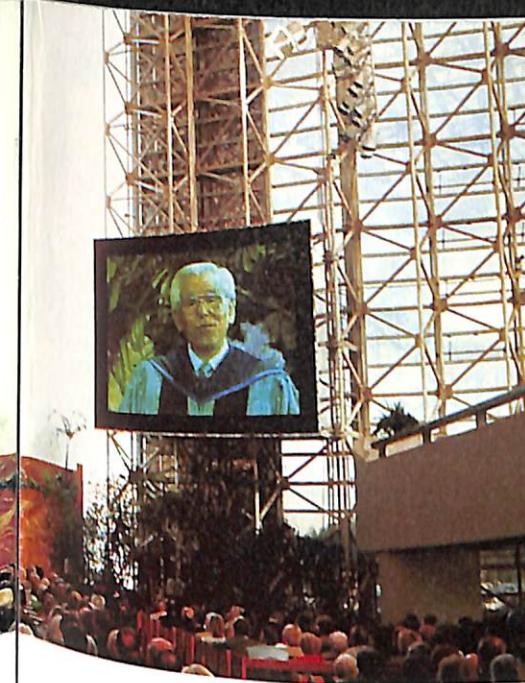
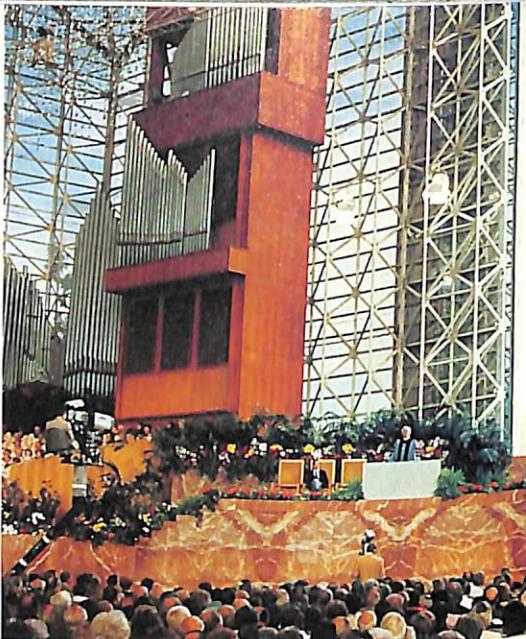
The brain, like the muscles, over-compensates and what appears to be chance is often a predictable result of the way we think. Asked to give the first number you think of between, say, one and five the chances are you'll say "Three". Be-

DANGEROUS FORCES

Ugandan witch, Alice Lakwena, leads her own army of rebels against the government of Uganda. Her followers believe that their faith makes them bullet-proof and that they can use empty soft-drink bottles as hand-grenades. They call themselves the Holy Spirit Movement.

If they are shot, they are told it is because they lack faith in Alice, who has been shot and injured herself. She is now in Kenya and her army – of children, old men and women – is dwindling.

Joe Lawrence



Frank Spooner Pictures

The Electric Church is the platform for tele-evangelist Dr Schuller and his weekly messages, which are televised live to millions of Americans.

rhyme for numbers from 1 to 10.

One:	A Gun
Two:	Glue
Three:	A Tree
Four:	A Door
Five:	A (Bee)Hive
Six:	Sticks
Seven:	Heaven
Eight:	A Gate
Nine:	A (Telephone) Line
Ten:	A Hen

Now match the things you want to remember with images based on the rhymes. If you want to remember a list of, say, a salt cellar, a book, a cup, a television set, a toy car, and so on, you might think of a salt cellar running amok with a machine gun. A man trying to open a book that is glued together. An apple tree with cups for fruit. A television set with a door in the middle of the screen.

Somehow, an odd number 'feels' more random than an even one. We also tend to go for numbers towards the middle of the range.

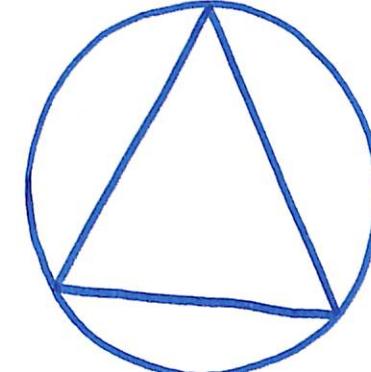
Another part of mentalism is memory trickery. If you try and name as many types of aircraft as you can, you will almost certainly have problems remembering more than seven. So how can mentalists remember hundreds of names or items?

Colourful images

One of the ways that memory works is to cross-reference bits of information, to bring ideas and images together. This happens naturally, but you can do it deliberately by making the images more colourful.

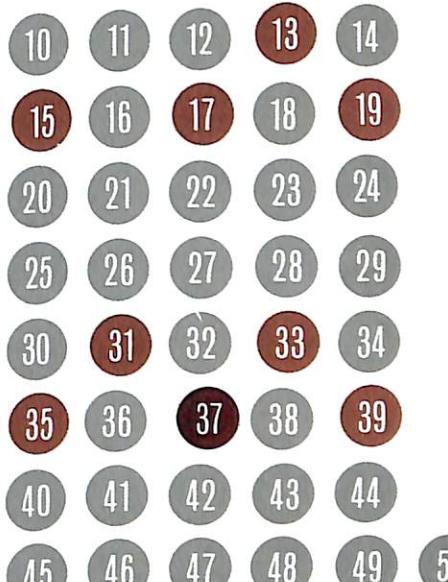
For instance, you can make a

triangle in a circle (or a hexagon).



Mark Franklin

Try thinking of two geometrical shapes, one inside the other. What you probably have are a triangle in a circle (or a hexagon).



THE DISAPPEARING THIMBLE



▲ Place a thimble on the first finger of your right hand, draw your left hand across the back of the right hand and the finger, then grasp the finger.

▲ Holding the first finger in your left hand, smoothly draw the hand off to reveal the vanished thimble. Then raise your left hand and slowly open it – it's magic.

MOVIE Magic

- Q OPTICAL EFFECTS
- Q MOVING MODELS
- Q STUNTS

THE MAGIC OF THE MOVING
image in the cinema and on television is part of our lives. From early childhood, we watch and accept. Yet the tricks and stunts that make us believe that fake is real are truly incredible themselves.

Movie magic can be divided, roughly, into two categories: photographic effects (achieved through camera 'trickery') and physical effects (such as explosions, fires and car crashes). Often a sequence will utilize both of these.

Frequently a sequence showing some vast structure, or dramatic scenery consists of a painting which is cleverly merged in with the

Harrison Ford in seemingly deadly danger at the climax of *Indiana Jones and the Temple of Doom*. In fact, the flames are well away from the actor.



real set or scenery. This is called a matte painting.

Traditionally, the effect was achieved by first filming the action through a matte. This is simply a sheet of glass, placed in front of the camera, partly covered with black paint so that the background, for example, is hidden. A second matte of the desired background is then prepared — the painted area matching precisely the blacked out area of the first matte and the rest of the matte blacked out. This is placed in front of the camera, the film rewound and the background shot over the previously shot action.

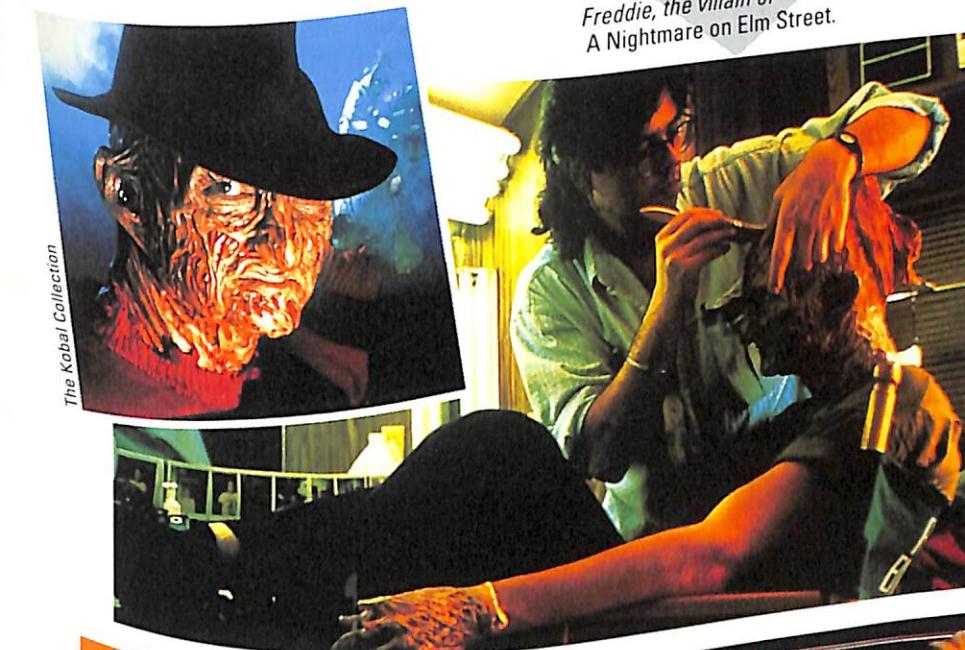
Travelling matte

A travelling matte changes shape from frame to frame. If an actor walks in front of either a back or front projection screen, his own body acts as a travelling matte, blocking off the background scenery on the screen in a different area from frame to frame. The most complicated travelling matte system is the 'blue screen process'. This enabled the space battles in *Star*

Rex Features

Horror films such as *Fright Night* normally feature extreme examples of the make-up artist's skills.

Robert Englund, in the hands of a make-up artist, becomes *Freddie*, the villain of *A Nightmare on Elm Street*.



The Kobal Collection

ELECTRIC DREAM

One of the most novel television programmes of recent years is the *Max Headroom* Show. The programme stars the character Max Headroom, who appears to be a computer-generated animation with stilted dialogue and mannerisms. His sentences often end in an 'echo' of both words and action, like an electronic 'tick'.

In reality, Max is American actor, Matt Frewer, whose make-up is designed to make him look flat and two-dimensional. His words and actions, both cleverly scripted, are electronically treated — using a digital delay device — to create the impression that he exists only in a computer memory and on videotape.



Rex Features



VISIONSPEAK

Cel: transparent plastic film on which are painted the pictures used in filmed animations

Chroma key: electronic method of combining parts of TV pictures received from separate cameras

Dolly: a wheeled truck on which cameras are mounted

Fade: describes the effect where a picture fades into black. Cross-fade, mix or dissolve imply that as one picture fades down another fades up

Inlay: electronic method of combining part of one TV picture with another

Matte: used to obscure part of an image being photographed in order to later combine another image on to the same frames of film

Pixel: tiny square or picture element, used to encode an image into computer language

Telecine: equipment used to transmit movie film in the form of television pictures. Each frame is scanned and converted into TV signals

Vision mixing desk: used for monitoring tapes for computer-controlled editing of film



THE FALL GUY

Best known in the American film industry for his spectacular falls, Dar Robinson's technique was unique among stuntmen. It involved wearing, concealed beneath his clothing, a harness connected to a thin, but very strong wire that was connected to a pulley firmly mounted to the roof or balcony from where he was preparing to launch himself.

The wire ran down his trouser leg via a cuff strapped to his ankle and it was Robinson's trick to fall backwards and upside-down in a manner that appeared totally real. Only when he was really close to the ground, would the wire jerk tight and his fall would come to a dramatic but safe end (out of camera shot, of course).

The technique has since become widely used among stunt men called upon to perform falls from great heights. Ironically, Robinson himself was killed in a motor-bike accident.

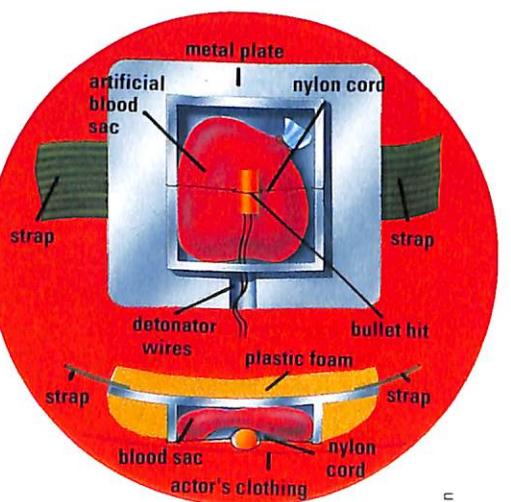
Falls and jumps are everyday work for stuntmen. The most popular technique today uses a wire attached to the stuntman's leg.

Wars to be created — when the actors or models were filmed in front of an illuminated blue screen.

Back projection involves the background being projected on to a translucent screen from the rear, while the actors are filmed in front. It was used a great deal in black and white film in the 1930s, but its drawback was that the background image was invariably dimmer than the foreground action.

Front projection

Front projection is the reverse of back projection. Many of the flying sequences in the *Superman* movies used this system. Christopher Reeve as Superman was suspended in front of the screen by a pole protruding from the screen which was obscured by his body. The aerial background projected on to



Mark Franklin

Bullet wounds on actors are achieved with a metal plate on which is remotely detonated an exploding 'bullet hit'. Behind this is a bag of artificial blood that breaks on impact.

Born Ehrich Weiss in Budapest in 1874, Harry Houdini was an infant when he was taken to America. While performing conventional magic, Houdini learnt to escape from handcuffs and shackles in his spare time. Houdini performed many publicity stunts. He jumped, manacled, into rivers, or escaped straight-jackets, suspended from buildings.

Backstage, before a show in Montreal in 1926, a group of university students asked if it was true that he could be punched without sustaining injury. Houdini said it was true. But before he could prepare, one of them landed four blows. He went on stage but, weakened after the show, he was taken to hospital. He died there a week later, on Hallowe'en, 1926, after an operation to relieve peritonitis.

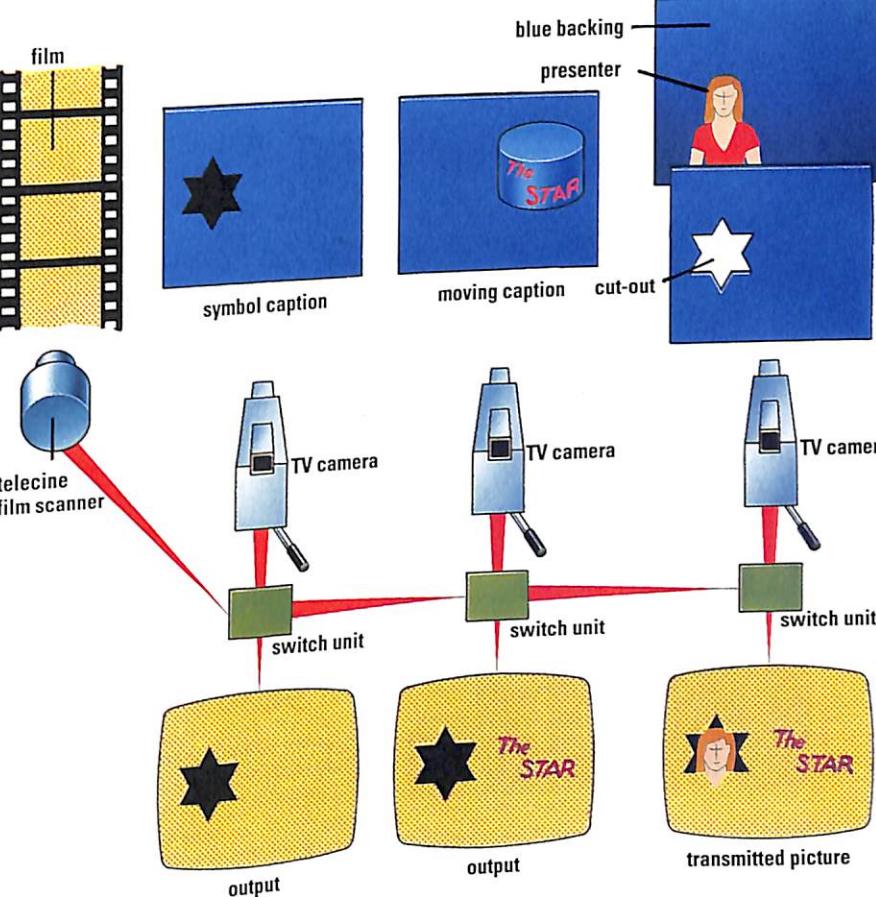
the screen behind him created the illusion of flight.

Chroma Key is the electronic method of combining pictures from two or more TV cameras. The technique involves an electronic switch that 'flips' over when fed with a certain colour signal from the primary picture. If the control colour is blue, wherever that blue occurs in the original scene the switch automatically removes it and substitutes pictures from a second or third source.

the screen behind him created the illusion of flight.

Miniatures or models have been used in movies since the very early days. Miniature ships, trains, planes, spaceships and even model cities are used more than ever today. In the climax of *The Living Daylights* where James Bond steals a Russian bomber and uses it to drop dynamite on tanks crossing a bridge, the bomber, tanks and bridge were all large models skilfully blended in with real backgrounds.

Traditionally, the shooting of miniatures or models involved them being moved by wires or small

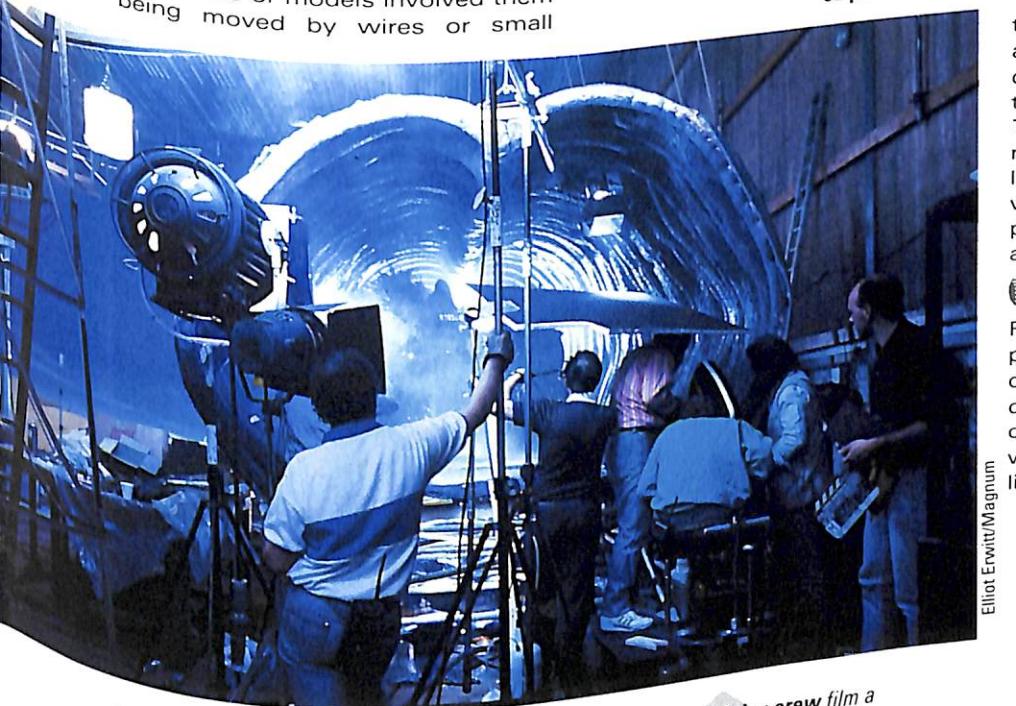


Mark Franklin

the *Star Wars* movies came up with a short cut by adapting their motion control computer to the process. In the sequence at the beginning of *The Empire Strikes Back* where the rebel base is attacked by giant Imperial Walkers, the models of the walking battle machines were computer controlled by means of rods attached to their feet.

Puppetry

Probably the most famous movie puppet is E.T. Today puppets are operated by a variety of sophisticated methods, ranging from radio control to hydraulic cables. There were six different E.Ts — three life-sized working models, which



Elliot Erwitt/Magnum

Camera and lighting crew film a scene on a set designed to look like the inside of a whale for Terry Gilliam's picture, *Baron Munchausen*.

internal motors while the camera remained stationary. The special effects technicians on *Star Wars*, however, came up with an alternative method — their models remained stationary in front of blue screens while a remotely operated camera moved past the model.

Laser blasts

Controlled by a computer, the camera could make exactly the same movement again and again so that the various components for a space battle sequence — laser blasts, star backgrounds or other spaceships could be added to the same piece of film.

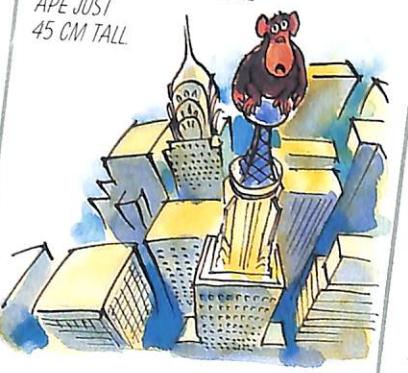
Stop-motion photography is the

technique that gives inanimate objects the illusion of movement. The process involves the use of a film camera that exposes just a single frame of film when activated. The animator then slightly moves the object or model figure into a new position, then exposes another frame of film. When the film is projected at normal speed the object or figure appears to be moving of its own accord.

Just amazing!

MODEL MONSTER

KING KONG, THE 15 METRE GORILLA THAT TERRORIZED NEW YORK, WAS A MODEL APE JUST 45 CM TALL



Paul Raymonde

